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ABSTRACT

Resulting from a 1980 workshop and a survey of 12 selected distance learning systems (or correspondence study programs), this paper had four aims: (1) to provide a framework to describe distance learning systems using audiovisual media and to locate the 12 surveyed institutions within that framework, (2) to identify common problem areas in the planning and management of audiovisual media, (3) to discover principles of planning and management to use in training, and (4) to identify how training and research might improve planning and management in this area and the methods by which this training and research can best be accomplished. Topics covered by the 11 chapters of the report include the analysis of the use of audiovisual media in the 12 institutions, the educational functions of audiovisual media, transmission and distribution, the production of broadcast materials, nonbroadcast audiovisual media (such as tape players and telephones), costs, feedback from users, institutional research, program evaluation, and training and research needs. The paper concludes that television and radio are of less significance in such teaching systems than was expected. Print is still the primary means of instruction, although the use of nonbroadcast media is increasing. (Author/JM)

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The planning and management of audio-visual media in distance learning institutions

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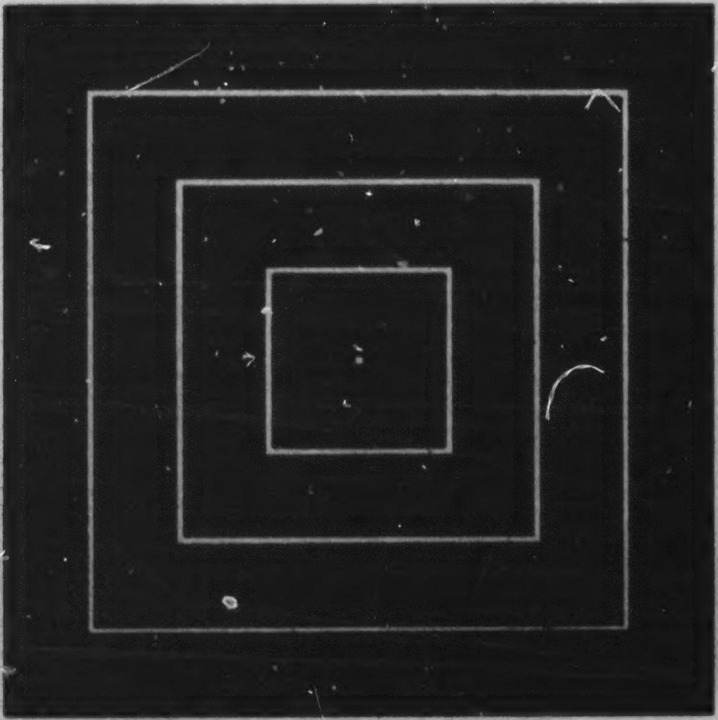

A. W. Bates

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International Institute for Educational Planning
(established within the framework of Unesco)

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The planning and management of audio-visual media in distance learning institutions

Final report of a workshop held
at the International Institute
for Educational Planning, Paris,
30 September - 3 October 1980

by A.W. Bates

International Institute for Educational Planning

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Preface

This report is the outcome of a Workshop on the Planning and Management of Audio-Visual Media in Distance Learning Systems, held at the IIEP in October, 1980. Written by Dr. Tony BATES (who is Head of the Institutional Research Division and the Audio-Visual Media Research Group at the Open University, United Kingdom) it is an expanded version of the working paper for that meeting, which has since been revised to take account of discussions and to include various recommendations which were made. It is based upon a survey of 12 selected distance learning systems, in various regions of the world, in which media play a significant rôle (or in which such a rôle is planned for the future); replies received from these institutions in response to a detailed questionnaire were used as the starting point for a discussion of media planning and management problems.

The workshop was one of a series of activities in the field of planning for educational media, carried out by the Institute in 1980. The Institute would like to place on record its gratitude to the Swedish International Development Authority (SIDA), with whose financial assistance the workshop was prepared and mounted.

Michel Debeauvais
Director, IIEP

The Planning and Management of Audio-Visual Media in Distance Learning Institutions

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1. IDENTIFYING THE INSTITUTIONS AND ISSUES

The Aim

The International Institute of Educational Planning (IIEP), whose main concern is carrying out, on an international scale, research and training programmes for educational planners and managers, is aware of the important developments in distance education throughout the world over the last 10 years. Those responsible for planning and managing distance learning institutions face a unique set of problems, not encountered elsewhere in the educational field. Two of the unique features of many distance learning institutions are their use of audio-visual media, and the relationship of distance learning institutions with external broadcasting agencies.

In order then to see whether this was an area in which there were special needs for training and research, and if so, to identify what these areas might be, and what kind of training and research would be required and appropriate, the IIEP organised a workshop in Paris in October 1980. As a preparation for this workshop, a discussion or working paper was prepared, based not only on a review of secondary information sources and the author's experience in this field, but also on a specially prepared survey of 15 selected distance learning systems in various regions of the world. In the end, usable replies were received from 12 of the 15 institutions. Those institutions which had returned the requested information by the date set were invited to send a representative to the workshop in Paris and representatives from 10 of the selected institutions were able to attend. The working paper aimed to identify those main issues which seemed to be common to a number of the participating institutions, and these issues formed the basis of the workshop agenda.

This final paper brings together material collected for the working paper, information collected after the deadline for the working paper, and the main points from the discussion at the workshop. While this paper is mainly meant to help the IIEP in its consideration of distance teaching and the research and training implications for planners and managers, it is also hoped that the workshop experience will have been of intrinsic value to the participants, and that this final paper will be of wider interest to those many planners and managers concerned with the role and use of audio-visual media in distance education who were unable to attend the workshop.

To summarise then, the main aims of this paper are as follows:

1. to provide an overall framework of describing different kinds of distance learning systems using, or planning to use, audio-visual media to a significant extent, and to locate the participating institutions within that broader framework;

2. to identify areas of difficulty that appear to be common to a number of distance learning systems, with respect to the planning and management of audio-visual media;

3. to examine whether there have been any general lessons learned with regard to the planning and management of audio-visual media in distance learning systems that could be used as a basis for training;

4. to identify those areas of training and research which might improve planning and management in this area, and the methods by which this training and research could best be done.

What is a Distance Learning System?

In trying to define and classify distance learning systems, it is unwise to be too dogmatic. There are more mongrels than pedigrees in this field, and it is much easier to recognise a poodle than to define one. Kaye and Rumble (1980) identify five models of distance learning systems at a higher education level. Rather than create a completely new classification system, their system has been extended to include distance learning organisations aimed at other educational levels as well.

Model 1: Independent organisations (e.g. correspondence colleges) providing distance tuition for qualifications or accreditation awarded externally and independently by a conventional public university. Kaye and Rumble's definition can be extended beyond the university level to include organisations offering distance tuition for courses based on a national school curriculum, or linked to public examinations at other than university level, for students who are no longer in the formal school system. Examples of organisations offering integrated multi-media courses of this kind are the National Extension College, United Kingdom, and the Institute of Adult Education, Dar-es-Salaam, Tanzania.

Model 2: Conventional universities which as well as providing conventional, on-campus teaching for internal students, also provide and administer their own distance learning facilities for off-campus, external students, often at local centres. There are numerous universities of this kind, combining correspondence tuition and often supplementary face-to-face tuition with radio programmes or telephone tutorials. Examples of this kind are the University of the South Pacific and the Universities of Lund and Linköping in Sweden. Again, Kaye and Rumble were concerned with university-level courses, but some universities, such as the University of South Australia, offer continuing education programmes separate from the degree programme, combining radio with correspondence tuition.

Model 3: Several organisations collaborating to provide between them integrated, multi-media courses for students over a wide geographical area. Sometimes, one of the collaborating institutions will provide accreditation, but often the courses may not lead to public examinations or accreditation. The collaboration may be co-ordinated or even controlled and financed by a single organisation (such as by DIFF in West Germany or NFU in Norway), or the collaboration may consist of an association of equal partners. "Start", a series of integrated, multi-media courses in English, was jointly designed and administered by the Swedish Broadcasting Corporation, two Swedish correspondence colleges, and the Swedish equivalent of the Workers' Educational Association (ABF). Because there are so many kinds of collaboration, this is a particularly difficult model to define precisely. The main point here is that the collaboration should be a closely planned one, with a good deal of integration between the different media.

Model 4: Kaye and Rumble's fourth model is "a massive centralised state provision for correspondence education at all levels" and they cite the French Centre National de Télé-enseignement as "a model probably unique to France."

Model 5: Autonomous institutions established solely and specifically for external students, using a variety of combinations of distance teaching methods to provide specially prepared multi-media courses, and with formal responsibility for evaluation and accreditation. This is perhaps the largest category, and includes the British Open University.

It has already been noted that Kaye and Rumble's models were drawn up to represent various kinds of distance-learning organisations in the higher education field, and while these models can be broadened to include institutions concerned with other target populations, there are still some significant kinds of distance-learning organisations which cannot be accommodated in these models. Two further models in particular need to be discussed:

Model 6: Media-based formal school systems. These are formal school systems where the teaching is predominantly through television or radio, although there may be some supplementary printed material. There may also be face-to-face tuition, often from less qualified or even unqualified tutors, but the essence of these systems is that nearly all the learning materials and content are designed and decided at a distance from the students and tutors. An example of where the whole curriculum is taught in this way is the American Samoa ITV project. There is also an example of where just one part of the curriculum is taught in this way, the Nicaragua Radio Mathematics project.

Model 7: Non-formal, integrated multi-media programmes aimed at adults, school leavers, or school drop-outs. These usually combine radio or television, a variety of print materials (pamphlets, booklets, posters, etc), often group sessions, sometimes without trained leaders, and sometimes even ethnic or local cultural forms, such as dance, drama, puppets, etc. They may be a part of a regular and continuing programme of education or development, such as the

Acciòn Cultural Popular (ACPO) in Colombia, or they may be single campaigns, which bring together just for the one project a number of different organisations and departments. The health campaign in Tanzania, "Mtu Ni Afya," is an example.

Even then, these seven models are not exhaustive. One might wish to create other categories to include the many organisations heavily engaged in distance education that cannot be accommodated in any of the other seven models. For instance, the seven models do not cover much of the work of the educational broadcasting services of the national or state broadcasting organisations or of Ministries of Education, such as conventional schools and further education broadcasting. The models also exclude much of the work of the myriad of broadcast and cable stations, channels, companies, corporations, commissions and consortia responsible for educational television services in North America. Many of these services are indeed multi-media, in the sense that the programmes are usually backed up with carefully prepared supplementary print material, and activities for the follow-up and pre-programme preparation for the classes. This might be considered an eighth model.

Another category not adequately covered by the models are the many correspondence colleges throughout the world that provide audio-visual support for their courses, in the form of audio-cassettes, telephone teaching, or linking the courses to series prepared by educational broadcasting organisations, making a ninth model.

However, these last two models are qualitatively different from the previous seven, in that they place an emphasis on a single medium (such as broadcasting or correspondence teaching). When one or more or such "single -medium" institutions collaborates to any extent with other institutions to provide other media and services (such as the broadcasting organisation and correspondence schools in the START English Language series in Sweden) then this can be considered to be a project within the co-operative multi-media model.

The other seven models can be arranged along a continuum from those where the formal school and university system depends on distance teaching methods at one extreme, to those systems that provide non-formal, non-credit, education to adults, school leavers and school dropouts at the other extreme. If Kaye and Rumble's classification is modified in this way, the various models of distance learning institutions can be represented as in Figure 1. Appendix I attempts to categorise over 50 institutions and projects across the seven models.

Several points arise from this classification system:

1. There are now very many institutions involved with distance education, in a very large number of countries throughout the world. Although Appendix I is not exhaustive, there are over 50 institutions concerned mainly with distance teaching, and if the broadcasting organisations, correspondence schools, health, agricultural and adult education agencies also involved in distance education projects using audio-visual media are also included, the number of participating agencies is likely to exceed a thousand. Distance teaching activities are now widespread and can be found in various forms throughout the world.

2. There is an enormous diversity of organisations and systems involved in distance teaching. Even within the same model (for instance model 5), there is enormous variety, with differences between institutions in developed and developing countries, between large and small institutions, and so on. Basically, each institution is unique, and any system of categorisation is open to criticism on grounds of inconsistency or incompleteness.

Figure 1

Figure 1: Range of Models of Institutions Engaged in Distance Teaching Using Audio-Visual media

A. "Systems-Based" Distance Learning institutions

	FORMAL						NON-FORMAL
MODEL NO.							
(BATES)	1	2	3	4	5	6	7
(KAYE & RUMBLE)	-	2	1	4	5	3	-
DESCRIPTION	Media-based formal school systems	Extension services of formal systems using A/V media for off-campus students	Independent d.l.s. teaching to external formal qualifications or syllabuses	Massive centralised system of continuing education, credit-giving	Autonomous, credit-giving multi-media systems established solely for distance learners	Co-operative multi-media systems, involving several organisations (credit and non-credit)	Autonomous, multi-media systems, non-credit giving
EXAMPLE	ETV Maranhão	University of Wisconsin, U.S.A.	Mauritius College of the Air	CNTE, France	Open University, U.K.	N.F.U., Norway	A.C.P.O., Colombia

B. "Media-Based" Institutions Involved in Distance Teaching

MODEL NO. (BATES)	8	9
DESCRIPTION	Broadcasting organisations	Correspondence schools
EXAMPLE	Childrens Television Workshop, U.S.A.	Hermods, Sweden.

3. Nevertheless, there do appear to be characteristics common to most institutions in Models 1 to 7. Furthermore, the IIEP workshop intended deliberately to concentrate on the the "central" models of distance learning systems. Broadcasting organisations and correspondence schools are rather different animals, and have their own "clubs" and arrangements for training and research for planners and managers.

It is therefore possible to characterise these "central" models of distance learning systems as follows:

1. Those that use, or plan to use, audio-visual media as a significant, but not necessarily major, part of their teaching system;

2. those that are concerned to plan the use of media in such a way that the unique features of each medium relevant to the teaching process are fully exploited.

3. those that place heavy emphasis on the self-instructional nature of the teaching materials, i.e. an emphasis on the various media between them being self-sufficient, or at least with a significantly reduced dependency on conventional face-to-face tuition;

4. those that are willing and able to use a range of media, and are willing to decide the emphasis on different media according to the educational needs of the organisation's prime target groups;

5. those that are able to make extensive use of existing facilities and infra-structures, but at the same time maintain their autonomy and independence from other institutions providing such facilities.

Preparing for the Workshop

The selection of institutions to participate in the workshop was determined by several criteria:

1. A need to make sure that a range of different distance learning systems were represented, so that the extent to which certain problems or issues were common could be identified.

2. A requirement that the emphasis should be on the more "central" distance learning models (since schools and broadcasting organisations were already reasonably well catered for in terms of planning and management studies).

3. A need to provide a world-wide geographical representation, since IIEP is a UNESCO-supported organisation.

4. A need to keep representation at the Paris workshop down to about 10 different institutions, due to financial constraints.

5. A need to ensure that only institutions using, or planning to use, audio-visual media were included.

6. A need to make early decisions about which institutions to include in the survey, so that information could be collected and incorporated into a working paper distributed in advance of the workshop, and so that invitations could be sent in good time to those providing the requested information.

7. Adequate foreknowledge by the workshop organisers of institutions likely to meet these criteria.

This was the basis on which the 15 institutions were initially chosen. Questionnaires were sent to those 15 institutions, and detailed replies were received from 12. Those institutions which had replied in time were invited to send a representative to the Paris workshop. All those invited accepted, although a representative from one institution (NURT, Poland) was at the last moment unable to attend. However, also able to attend was the former chancellor of the now moribund Free University of Iran. In all, 10 of the selected institutions were represented at the Paris workshop, plus the former chancellor of the Free University of Iran. There were also several others in attendance. Table 1 sets out the list of institutions approached and those who sent representatives. Appendix 2 provides full details of those attending, and the agenda of the workshop.

It can be seen from Table 1 that the institutions included in the study represent five of the models (1, 3, 5, 6 and 7) and were within the "central" range set out in Figure 1 (page 8). Seven of the 12 organisations are in Model 5, generally thought of as "open university" models. The selection of institutions cannot in any way be considered statistically representative. However, there are enough representatives of one of the central distance teaching models (model 5) to explore the extent of similarities and differences within one model, and there are enough representatives of other models to see how general problems are likely to be.

The questionnaire was designed by the author and the questions were chosen as a result of his experience of the use of media both at the Open University in the United Kingdom, and as an international consultant to several distance learning systems in other countries. The questionnaire aimed to elicit information, in a comparable form, from each institution on the following issues:

Table 1: Institutions Approached in Connection with IIEP Study

Model No. (Kaye & Rumble)	Model No. (Bates)	Institution	Country	Replied to Question.	Attended Workshop
-	1	Educational Television Foundation of Maranhão	Brazil	X	X
2	2	University of Zambia	Zambia	-	-
1	3	College of the Air	Mauritius	X	X
		Distance Learning Centre	Lesotho	X*	-
4	4	-	-	-	-
5	5	Allama Iqbal Open University	Pakistan	X	X
		Athabasca University, Alberta	Canada	X	X
		Everyman's University	Israel	X	X
		(Free University of Iran)	(Iran)	-	X
		National Radio and Television University for Teachers	Poland	X	-**
		Open University	United Kingdom	X	X
		Palestine Open University	Palestine	-	-
		Sri Lankan Institute of Distance Education	Sri Lanka	X	X
		Sukhothaithammathirat	Thailand	-	-
		Universidad Estatal a Distancia	Costa Rica	X	X
3	6	Norwegian Institute of Distance Education	Norway	X	X
-	7	Institute of Adult Education	Tanzania	X	X
			TOTAL:	12	11

* Reply received too late for invitation

** Invited but unable to attend.

1. General background information about the institution.

2. The actual and planned use of audio-visual media.

3. Issues concerned with the choice of educational functions for audio-visual media.

4. Issues concerned with the transmission and distribution of audio-visual media.

5. Issues concerned with the production of broadcast materials.

6. Issues concerned with the production and distribution of non-broadcast materials.

7. Issues concerned with feedback, institutional research, and evaluation.

The qualitative data from the questionnaires are summarised in tables in Appendix 3, and the open-ended information is incorporated into various sections of this paper.

Once the questionnaire was designed and sent out to the 15 institutions, an extensive literature search was carried out on distance learning institutions. Ideally, this should have been done before selection of the institutions and the design of the questionnaire, but practical time constraints made this impossible. A consortium of 16 distance learning organisations has established an excellent documentation centre on distance learning located at the United Kingdom's Open University. This documentation centre contains published articles, prospectuses, internal papers, and case-studies (many unpublished) from a very large number of distance learning institutions. Although the literature search for this study was not exhaustive, it was sufficient to identify and illustrate a number of relevant issues, and this information has also been incorporated into the study. A full bibliography is included as Appendix 6.

Thus, the questionnaires, the literature search, and the author's own experience were used as a basis for the preliminary working paper, which was distributed in advance to all workshop participants. Each main section of the paper was discussed at the workshop (see Appendix 2 for the workshop agenda). The main points raised during discussion at the workshop have also been included in this final paper. One major area which participants at the workshop felt had been omitted in the working paper was that concerning costs and costing methods, and consequently the final paper includes a discussion of this issue as well.

Lastly, the final session of the workshop dealt with the specific issue of whether training and research was required, and, if so, the best ways to approach this problem. Section 10 of this paper summarises these views.

2. 12 PARTICIPATING INSTITUTIONS AND THEIR USE OF MEDIA

Allama Iqbal Open University, Pakistan (Model 5)

Originally known as the People's Open University, Allama Iqbal was set up in 1974. At the present time, it has three main programmes: in-service teacher education; general degree-level education for those with up to University level qualifications; and functional education, i.e. courses related to occupational or community needs. It has currently 31000 enrolled students, and 20 different courses on offer, although it plans to offer 136 courses eventually. The principal instructional medium is the correspondence text, specially prepared for the Allama Iqbal Open University by full-time internal academic staff and contracted external staff. Students study primarily at home. They are assigned to correspondence tutors, who give grades and send back comments to students. Radio programmes are also available on most courses, and television on some. There are currently 75 local centres spread throughout Pakistan, although it is planned to have 200 eventually. Face-to-face tutorials and television and radio receivers are available at study centres.

Radio is already used extensively, providing five hours a week transmission through the national broadcasting network, although staff in the Institute of Educational Technology in the University produce the programmes. Nearly all courses use radio, which can be received by nearly all people throughout Pakistan. Broadcast television is less extensively used by Allama Iqbal. Programmes currently are produced by the Pakistan National Television Corporation, at the request of the University, although the University is trying to obtain its own television production facilities and its own producers. Production levels for individual producers are currently very heavy. Currently, about 35% of the country can receive television transmission. Apart from copies of radio programmes available at study centres, Allama Iqbal does not use audio-cassettes. Radio and television programmes are pre-tested by the University's research and evaluation unit, and this often results in substantial changes to the programmes.

Athabasca University, Alberta, Canada (Model 5)

Athabasca University was originally set up as a small campus-based University in 1970, but became primarily a distance learning organisation in 1975. Athabasca University specialises in distance education involving a variety of media - television, audio-tape, print and telephone. By providing non-credit and credit courses for undergraduate degrees, Athabasca University serves adults who cannot or do not wish to attend a conventional university. There are currently 50 courses on offer. All are at an undergraduate level and through a series of credits can be combined into a degree or used to fulfill requirements for transfer to other Canadian universities, or used singly to pursue individual intellectual interests. Courses are designed by full-time staff at the University, but are often based on already existing materials bought in from other institutions. Eventually it is planned to offer around 200 different courses. There are currently 3500 students enrolled, and this is expected to rise to a maximum of around 12000 by 1985. The students do most of their learning at home, using packaged study materials produced especially for adults learning at a distance. These materials include study guides, textbooks and workbooks, sometimes supplemented by cassette tapes or laboratory kits. In some courses there are TV and radio programmes broadcast over local channels, and laboratory, workshop or classroom sessions held in centres around Alberta. Courses are backed up by experienced tutors who talk with each student at regular intervals, usually over the telephone. There are currently 5 local centres, although it is planned to extend these to 10 or 15. Although these centres are well equipped, containing video replay equipment, computer terminals, a small library and teleconferencing equipment, it is not considered essential for students to attend local centres. Many of the courses consist of carefully selected material bought in from other institutions. The main teaching medium though is print.

Radio is used on a comparatively small scale, about 15 programmes being produced (on campus) in 1980, although it is expected that this number will increase in future. Radio programmes are also available on cassette and are mailed direct to students homes, on request. Radio covers about 90% of the population in Alberta. Television is used even less than radio. Athabasca does not produce its own programmes, but can commission programmes from ACCESS, Alberta's educational television consortium, free of charge. However, the time required to negotiate and produce programmes is often too long to fit in with the production schedule for the rest of a course. Distribution is also a problem. There is a complex variety of local cable systems and direct broadcasting, and trying to provide coverage for the whole area if often very difficult, involving negotiations with several different stations. In any case, only about 50% of the target population are covered by stations available to Athabasca University. Some courses have video-cassettes for use in local centres, and this has proved more easy to manage. A number of courses also have audio-cassettes, which are mailed direct to students. Nearly all students have their own audio-cassette machines. Telephone tutoring is a major part of the teaching system. Radio and television materials are not usually formally evaluated by the University.

Educational Television Foundation of Maranhão, Brazil (Model 1)

ETV Maranhão was set up in 1969 in the remote north-eastern state of Brazil, in an attempt to improve on the low rate of high-school level enrolment (then below 13%) and to overcome an acute shortage of qualified teachers. It now provides a full high-school curriculum for over 21,000 pupils in 45 localities throughout the state, as well as, more recently, cultural programming in the evenings. The main teaching medium is the broadcast television programme, developed by ETV Maranhão's own curriculum development department and its own producers, but supported by accompanying texts, also specially prepared. Students attend one of 45 reception bases, which are similar to schools, but instead of being manned by qualified teachers, there are altogether approximately 700 monitors to assist group work based on the television programmes, and to provide individual help, although the materials are designed primarily to encourage self-help and group work. Each classroom has its own television set. Students carry out one written assignment per month per subject, marked by the monitors according to rubries provided by the curriculum development department. and sit examinations at the end of each year.

ETV Maranhão itself produces around 500 programmes annually. In addition, it provides cultural programming in the evenings for a general audience, producing its own local material, as well as taking about 3 hours a week of national cultural programming via a satellite link. All programmes are broadcast, and cover about 50% of the state. The high-school programming uses about 20 hours a week transmission time in two shifts. Students carry out follow-up work when not viewing programmes. ETV Maranhão has its own internal evaluation system, based on student performance and feedback from the monitors, and has also been externally evaluated by a UNESCO team.

Everyman's University, Israel (Model 5)

Everyman's University was also formally established in 1974, to provide "higher education for all strata of the population.......in their homes without interrupting their normal occupations." First students were enrolled in 1976. By 1980, there were 10,000 students enrolled with an eventual expected target of around 15,000 students. The University offers a range of about 100 courses (eventually rising to about 250). These courses enable students to follow a degree programme, pre-academic preparatory courses, vocational, and general, continuing education courses. The main teaching medium is the correspondence text, written by Everyman's academics or by external consultants, but radio, television and audio cassettes are also available on many courses, as well as home experiment kits on science courses. There are 30 local centres throughout the country, where face-to-face tuition is provided, and where equipment learning materials such as video and audio cassette machines are provided. Attendance at local centres, however, is not compulsory. Students are assigned to part-time correspondence tutors, who mark assignments and often act as face-to-face tutors at local centres. Quite often, externally produced material (text books, films, etc.) are bought in and amended or adapted as course material.

Radio is used quite extensively, 90 new programmes being produced, and a total of 250 distributed in 1980. The Israel Broadcasting Authority produces the programmes, in conjunction with academics from Everyman's University. There is five hours a week scheduled radio transmission time at reasonable times for Everyman's University, and the programmes cover virtually all the country. Copies of the programmes are available on cassette at local centres. Television is used to a lesser extent. 30 television programmes were produced, and 120 distributed, during 1980. About half the programmes are produced by the national educational television organisation, and about half are produced within the University by the Centre for Educational Technology, which has its own, trained television producers. Programmes are sometimes based on existing programmes, which are adapted or re-dubbed in Hebrew. Approximately 3 hours a week are available on the single national television channel which covers 95% of the population. Obtaining adequate television transmission time is a problem, and not all programmes available can be transmitted. Television programmes are also available on video-cassettes at local centres.

Audio cassettes are also mailed directly to students on some courses (75% of the students have their own machines and those who do not can borrow machines from Everyman's University), and as at Athabasca University it is left to the course team to decide, usually during the detailed planning of a course, whether or not to use television, radio or cassettes. Requests can usually be met by the Centre for Educational Technology. There is a small evaluation and institutional research unit, which evaluates courses as a whole, and the value of the different media has been found to vary considerably from course to course.

Institute of Adult Education, Tanzania (Model 7)

The Institute of Adult Education is a parastatal organisation under the aegis of the Ministry of National Education. It has responsibility for higher and further education, notably through correspondence courses and evening classes. Within the Institute is a radio section, which provides production resources for a variety of government educational agencies, and the Department of Correspondence Education, which currently is producing about 21 correspondence courses, supported by radio programmes produced in the radio section. The Department was set up in 1970, and the first students were enrolled in 1972. The courses are aimed primarily at out-of-school adults and young people, and include teacher education courses, health and vocational courses, functional literacy courses, and courses for the secondary school certificate. Apart from the teacher training programme, students are self-paced, in that they are sent new material when they have submitted an assignment. This means that it is difficult to know exactly how many students are actively studying, but in 1979, approximately 38000 students were enrolled on courses other than the teacher training programme. The self-pacing of students also makes it difficult to coordinate radio programming with students' individual study patterns. The correspondence material is designed, printed and distributed by the Institute's own staff. The Institute has 20 regional offices, which also organise local evening classes, though these are not necessarily linked to the radio programmes or the correspondence courses. For students enrolled with the Department of Correspondence Education, the correspondence texts are the main teaching mediums. For the teacher training programme, there are face-to-face tutorials organised on three days a week, as well as on the correspondence texts and radio programmes.

The radio section produced and transmitted 34 radio programmes for the Department of Correspondence Education in 1980. Programmes were produced by the Institute's own staff, and transmitted by the national broadcasting organisation, Radio Tanzania. Around 45% of the population are covered by the radio transmissions. There is no television on the mainland, but the IAE hopes to use television when it becomes available. Audio-cassettes are not used, since audio-cassette machines are not widely available amongst the target audience.

In addition, the Institute of Adult Education has been involved in the production of programmes and materials for the various national campaigns.

Lesotho Distance Teaching Centre (Model 3)

Set up in 1974, with the first students enrolled in 1976, the Lesotho Distance Teaching Centre now has approximately 10,000 enrolled students, and this is expected to rise to around 30,000 when fully operational. As well as courses aimed at adults wishing to obtain the standard secondary school qualification, the LDTC also offers courses aimed at up-grading primary school trachers, functional literacy and numeracy, craft training and family planning. Currently, the Lesotho Distance Teaching Centre has 12 courses on offer, but hopes to expand this number considerably (to over 100) when fully operational. Courses are prepared by LDTC's own staff, and part-time consultants specially hired for the purpose. The LDTC recruits part-time tutors who mark assignments, and provide face-to-face tutorials about once a fortnight, as well as the occasional residential school. The main medium is the correspondence text, but radio is being increasingly used, as more and more students get access to radio. There are currently seven local centres, with a total of 12 eventually planned. Correspondence material, radios and cassette recorders are available at local centres.

Radio is extensively used. 450 programmes were produced, and 500 distributed in 1980, requiring four hours a week transmission time, in the late afternoon/early evening. LDTC has its own radio production facilities, but allows other agencies also to use its facilities. Programmes are broadcast on the national radio network. It is estimated that about 40% of the target audience can be reached by radio. The decision on whether or not to use radio on a particular course is determined as the course is developed, in terms of whether it lends itself to radio. About 50 specially-made audio-cassettes were produced in 1980, and made available in the local centres. However, the technology is relatively unfamiliar to most students, and the cassettes so far have been used rather half heartedly.

LDTC has its own evaluation and research unit, and all its programmes are pre-tested before distribution, and most programmes are also evaluated after transmission. Programmes are often revised as a result of the evaluation studies.

The Mauritius College of the Air (Model 3)

The Mauritius College of the Air is a parastatal organisation under the aegis of the Ministry of Education. It was established in 1971, and after a pilot course in 1972, its first full course for schools was started in 1973. From the start, the MCA had two main aims: firstly it was to provide, through television, radio and texts, support and help for the upgrading of the quality of education in secondary schools; and secondly to provide support services for non-formal education. However, until recently, the Ministry had requested MCA to give priority to support for the secondary schools. Particularly since 1976, however, the Ministry's Institute of Education has taken substantial steps to improve the quality of education in secondary schools, and consequently MCA is now moving more into the area of non-formal education, although currently broadcasts for schools still constitute a large part of its output. In 1974, about 15000 students in 61 schools followed MCA programmes. Numbers are probably less now, due to a reduction in programmes for schools. In the out-of-school areas, MCA has provided courses for those wishing to re-take School Certificate, English Language courses for those who have left school, a consumer education course, and health programming. The media used by MCA are correspondence texts, broadcast television, radio, audio-cassettes, and direct tuition, depending on the course. All courses are specially designed by the MCA, usually by part-time staff specially recruited by the MCA, although it also has its own "core" staff. The MCA aims to establish 4 or 5 local centres for non-formal education.

Television and radio programmes are produced by the Mauritius Broadcasting Corporation, a commercial organisation, which the MCA pays for recording. It does not, however, pay for transmission. MCA is allocated television transmission times by MBC at mid-day (3 slots a day between 11.30 and 1.30) and one slot on Saturday afternoon. There is one midday radio slot and one evening radio slot. Both radio and television have 100% coverage of the island. The MCA participates in the French Agence de Co-operation Culturelle et Technique's "Production Harmonisée" project. In this project, each of 12 different francophone countries finances a short 16mm film. All the films are made available to all 12 countries. This means that MCA obtains 12 educational films in French for 12-15 year olds, for the price of one. MCA also buys in foreign series from Britain. There is no formal evaluation of MCA programmes.

The Norwegian Institute of Distance Education, Norway (Model 6)

Norsk fjernundervisning (NFU) was established by Act of Parliament in 1977, and its first courses will be represented in 1981. Its main aim is to provide educational opportunities for adults who are unable to use existing educational facilities. Since Norway already is well-served by commercial correspondence schools, by adult education organisations who provide local evening classes, and by a national broadcasting organisation with an education department, but all working relatively independently, NFU is intended to bring these organisations together, to provide integrated multi-media courses, in areas of greatest need. NFU receives funds from the government which it can channel to cooperating institutions, to pay for their services for specific NFU courses. It has an advisory council, and a governing board which determine initial areas of priorities. Once the board has decided that a particular group or topic may be an area of priority, a small preplanning group is appointed, to look at the feasibility of providing a course, to estimate likely student numbers and costs, and to determine which organisations should be invited to participate. If the pre-planning group's recommendations are accepted, a course team, including independent subject specialists and representatives from participating organisations, is set up, to implement and maintain the course. Each project is likely to vary in its use of media, but the main media are likely to be correspondence texts and tutoring, television and radio programmes, audio-cassettes, and face-to-face tuition at local centres.

Television and radio programmes will be made (on a full-cost basis) by the state national broadcasting organisation (NRK) if it is decided by the pre-planning group to use broadcasting. Producers from NRK will be full members of the course team responsible for implementing a course. Programmes will be transmitted on the one national television channel, and on the second radio channel. Both radio and television can be received by about 90% of the population. Plans for the use of video or audio cassettes are not yet known, but they are almost certain to be used on some courses, as is telephone teaching. There are also plans for each course to be evaluated.

National University of Radio and Television for Teachers, Poland (Model 5)

N.U.R.T. enrolled its first students in 1974. It was set up in response to a government decision to create an all-graduate teaching profession in Poland. NURT uses television, radio and printed materials to teach in-service, non-graduate teachers who study while still employed as teachers. The curriculum is co-ordinated with the curriculum for full-time graduate teachers - indeed, full-time graduate student-teachers have to follow some of NURT's programmes. The graduate programme is made up of 8 different courses. Currently there are 70,000 enrolled students. The print materials form a supplement to the regular teacher's journal. They constitute scripts of the programmes, with follow-up work, recommended reading and exercises. Teachers can attend one of 10 local teaching centres for seminars and face-to-face tutorials. There are video and audio replay facilities at these centres. There is an examination at the end of each course. All materials are prepared by academic staff of Universities and other higher education institutions according to curricula laid down by the Institute for Teacher Training.

Television is the main medium, in that the "core" teaching material is contained in the programmes. In 1980, 130 programmes were produced and transmitted. Radio is also heavily used, 80 programmes being produced and transmitted in 1980. Programmes are produced by the national broadcasting organisation, which provides 3 hours a week transmission for the television programmes and 2 hours a week for the radio programmes. Nearly everyone in Poland can receive the television and radio transmissions. Audio-cassettes are not used, other than to provide copies of radio programmes at local centres. Programmes are not pre-tested before distribution, but there has been evaluation of the courses as a whole by the Institute for Teacher Training.

The Open University, United Kingdom (Model 5)

The Open University was established in 1969 to provide higher education facilities for any adult in Britain who had not had the opportunity of a University-level education, irrespective of previous educational qualifications. Students study mainly at home, through the use of specially prepared correspondence texts, television and radio programmes and correspondence tutoring (on nearly all courses). In addition, on some courses there are home experiment kits, audio-cassettes, set books, summer schools, telephone tutorials, computer aided instruction and regular face-to-face teaching at local centres. The main teaching medium is the correspondence text. Currently the University offers an undergraduate programme of 127 different courses, a continuing education programme of around 60 courses (including some of the undergraduate courses which can be taken singly) and a small post-graduate degree programme. There are currently 60,000 students enrolled in the undergraduate programme and 25,000 enrolled in the continuing education programme. Courses are prepared by teams consisting of full-time academics employed by the Open University, BBC producers, editors, educational technologists, regional staff representatives and a course administrator. The University uses a combination of continuous assessment and end-of-course examination. There are 260 local centres, used for face-to-face tutorials and counselling, and containing a TV and radio receiver and an audio-cassette machine, plus some copies of the correspondence texts.

Broadcasting constitutes just under a fifth of the total budget. The BBC is a partner with the Open University. The Open University pays the full cost of broadcasting, and the BBC has set up a special department for producing Open University materials. The Open University opens its own studios on campus in 1981 (these will be managed by the BBC on its behalf). In 1980 the BBC produced about 250 new television programmes, and transmitted about 1500 television programmes. This required 35 hours a week transmission time. About 200 radio programmes were to be produced in 1980 and 1400 were transmitted, requiring about 25 hours a week transmission time. Both television and radio are transmitted on national BBC networks. BBC producers are full members of the course teams. The use, however, of radio is dropping quite rapidly, due to the increased use of audio-cassettes. 120 audio-cassettes were produced in 1980 (as cassettes) and mailed directly to students. Students can also obtain cassette copies of radio programmes on request. Programmes are not usually pre-tested, but there is an on-going evaluation programme for the broadcasts, carried out by a small research team.

Sri Lankan Institute of Distance Education (Model 5)

SLIDE was created in 1977 from a merger between the Technical Education Extension Services Unit and the Technical Education Curriculum Development Unit. It is eventually hoped that SLIDE will be incorporated into a national Open University in Sri Lanka. Three groups of courses are currently being offered: National Diploma courses in Maths and Science; Higher National Diploma course in Management Studies; and Higher National Certificate in Technology. At the end of 1978, there were just over 5000 students enrolled. The main teaching medium is printed or duplicated lessons mailed to students. Each course is prepared in three different languages. There are 15 Technical Institutes which act as local centres for weekend tutorials. Courses are planned and written almost entirely by external staff from the University and Technical Institutes, and sent to SLIDE for translation and distribution.

At the moment, SLIDE does not use audio-visual media, although it is experimenting with audio-cassettes on some courses. Location of cassette machines and tapes in the lacal Technical Institutes is being considered. There are plans to make use of radio, and negotiations for production and transmission facilities are under way with the relevant authorities.

UNED, Costa Rica (Model 5)

The National Distance University was set up in 1977 and its first students enrolled in 1978. It is aimed at those who cannot begin or continue studies at the conventional universities, agricultural and industrial workers who although with the ability to attend university are unable to do so, and at widening the access of adults to higher education. Currently there are 7000 students enrolled, eventually rising, it is expected, to around 15000. There are currently 36 courses on offer, planned to rise to 78. UNED has its own Curriculum Planning Office, which decides which courses will be offered. It then hires external consultants to prepare the text materials. The texts are the main teaching medium, and all courses also have monthly face-to-face tutorials provided through 18 local centres. Most courses also have broadcast television programmes, and on some courses there are home experiment kits, audio-cassettes and telephone teaching. It is planned to use radio in the near future. Tutor-coordinators who mark student assignments and provide face-to-face tuition are based in local centres.

Currently 60 television programmes a year are produced, and it is expected that this number will increase to about 120 a year when fully operational. Programmes are produced (without charge) by a commercial station to scripts prepared by the University's audio-visual office. (Scripts are written by UNED's own tutor-coordinators). UNED, however, is planning to obtain its own studio. Television programmes are broadcast for four hours a week on the national commercial channel. There is a new government financed National Cultural and Educational Television Channel, and negotiations for access to this channel are underway. Radio is not yet being used, but UNED plans to purchase its own studio, to produce around 150 programmes a year, and again, it is hoped to have access to the new national educational radio channel, for about one hour a week. The University has already produced a few audio-cassettes for distribution to the local centres. Cassettes are produced, copied and distributed by the University's own Audio-Visual Office. It also has facilities for video-cassette copying, to enable copies to be available at local centres, using the host institution's replay equipment. There is no unit specifically responsible for formal evaluation of course material, although there is an Office of Quality Control, which monitors the academic standard of the teaching materials.

3. AN ANALYSIS OF THE USE OF AUDIO-VISUAL MEDIA IN THE 12 INSTITUTIONS

It can be seen from the previous section that the institutions varied considerably, but nevertheless certain points emerged which are worth noting:

a. Number of students. All institutions that provided data on this issue either have or expect to have more than 10,000 students but none anticipates numbers substantially exceeding 100,000. Three institutions (Athabasca, Everymans, Costa Rica), even when fully developed, will have comparatively small numbers. Thus, although many of the institutions are using the mass media of broadcast television and radio, none was aiming at really mass audiences. For instance, even though the Open University has over 80,000 students, the largest number of students on any single course (and hence the largest student audience for any single television programme) is around 7,000. The main reason most institutions were using broadcasting was not primarily because it reached large numbers of students, but because it was one of the few ways (or the only way) the target audience could be reached where it was considered best to teach them. However, it needs to be recognised that although there may be substantial numbers of non-registered students or "eavesdroppers," none of the institutions in study had really reached a mass target audience with its programmes.

b. Number of Courses: Despite this, six institutions intend to offer a very wide range of courses - between 75 and 250. The implications for the provision of audio-visual media are obvious. To provide extensive television support for many courses when student numbers per course are low (and Everyman's for instance, will have an average course size of 60) would be very expensive, and it would be difficult if not impossible to find a sufficient amount of transmission time to accommodate all the programmes that would be generated if all the courses had extensive television or radio support. However, when student numbers are low, the physical distribution of non-broadcast audio-visual materials (on cassette, etc.,) becomes more feasible.

c. Life of Courses: Nearly all the institutions expect their courses to run for between four and five years. The exception is the Open University, which for economic reasons has been forced to run its courses for an average of eight years. If television or radio programmes are expected to last for the life of a course, this will have serious implications with regard to the amount of production and transmission required.

d. Local Centres: All twelve institutions have a network of local centres, although attendance is not essential in any except Maranhão (which is a school system). In most cases, students are not expected to attend more often than once a month on average. This also has implications for the use of audio-visual media. None of these eleven systems can apparently rely on full student attendance at local centres, so these can be used to provide no more than a back-up service for the distribution of audio-visual materials, unless such materials are to play a very minor role overall in the teaching system.

e. Range and Comparative Importance of Different Media: Apart from NURT in Poland, Maranhão in Brazil, and Mauritius College of the Air, print materials (usually correspondence texts) are the main medium of instruction in each system. Nevertheless, seven of the twelve systems provide television broadcasts on most courses, so far. However, this position will obviously have to change, quite soon and quite rapidly, in those institutions which aim to achieve their planned target of a large number of courses. In other words, these institutions will have to use broadcast television much more selectively. On the other hand, none of the eleven institutions already operational plans to make video-cassettes available for most of its courses. Surprisingly, in only three of the twelve institutions is radio used on most courses (Allama Iqbal; NURT, Poland; and the Open University), although Athabasca, NFU, Norway SLIDE and Costa Rica are considering using it extensively in the future. All but Maranhão used radio to some extent. No doubt if more examples from models 2 and 7 had been included, radio would have been more prominent in the teaching systems. The use, planned or actual, of audio-cassettes is also comparatively low, only six institutions planning to use tham at all. Four institutions (Athabasca, Everyman's, Open University and Costa Rica) are using telephone teaching extensively, and most of the twelve provide some form of face-to-face teaching.

f. Television: Apart from Maranhão, all the systems using television are dependent on separate broadcasting organisations for the production and transmission of their television programmes. Several institutions were very vague about the actual amount of programmes to be produced and distributed this year, and were particularly vague about future production and transmission levels, both for television and radio. All institutions using television broadcast directly to the students' homes, although Maranhão's and Mauritius' main target audiences were students in schools. Five of the seven institutions for whom it might be relevant either already made available video cassettes at local centres as well, or definitely plan to do so in the future. The Open University still has not made up its mind on this issue, but is unlikely to use video cassettes extensively. For those that use television, coverage is generally extensive, reaching over 90% of students in six institutions. The two institutions which have comparatively low television coverage are Allama Iqbal (with 35%) and surprisingly, Athabasca (50%), due to the complexity of the province's broadcast and cable systems.

g. Radio: Except for the Open University and NURT, Poland, production levels tend to be higher for radio than for television, and in most institutions, radio production levels are planned to be even higher in the future. The exception to this trend is the Open University, which is steadily reducing radio production in favour of non-broadcast audio-cassette production. Whereas nearly all the institutions use separate broadcasting organisations for the production of their television programmes, half the institutions have their own radio production facilities. All nine institutions using (or planning to use) radio transmit direct to students' homes, but four - Athabasca, Open University, Costa Rica, and NFU, Norway - will also mail cassette copies of radio programmes direct to students' homes, while four others make cassette copies available at centres. Radio coverage is very high (over 90%) for all institutions except Tanzania (45%) and Lesotho (40%).

h. Audio-Cassettes: Five institutions (Athabasca, Everyman's, Lesotho, Open University, Costa Rica) produce non-broadcast audio-cassettes, all in their own studios, although the BBC also produces some of the Open University's cassettes. Sri Lanka is also considering producing cassettes. Ownership of cassette machines by students varies enormously from institution to institution.

In summary, seven of the twelve institutions use both television and radio to some extent, but in nine of the twelve institutions, neither radio nor television is the main teaching medium.

4. THE EDUCATIONAL FUNCTIONS OF AUDIO-VISUAL MEDIA

a. Strategic Functions

This section discusses perhaps the most difficult question in the whole field of distance education: why use audio-visual media at all? What unique educational functions do they provide? What contribution do they make to distance learning that cannot be provided through print material and correspondence tuition?

Many a promising academic career has been buried and lost for ever in pursuit of this question. Certainly, there is no current educational theory of teaching or learning that can provide an adequate answer (for a good review, see Heidt, 1978). However, is not experience the best teacher of all? Surely enough experience has been gathered from the 53 organisations listed in Appendix 1 to answer this question?

From a reading of the literature, and an analysis of the questionnaire responses, the answer seems to fall into two parts. Firstly, there are pretty clear strategic reasons for using audio-visual media, particularly broadcasting. Strategic reasons are general; they are the distance learning system's overall justification for using audio-visual media, and would apply to any course in the system using television or radio. Tactical reasons on the other hand are specific to each course or unit, and will vary according to the educational task at hand. The strategic reasons for using television and radio in distance learning systems are well known, and there is no need to dwell on them, except where there is reason to question their validity:

i. Access to students. In most distance learning institutions, television and radio are two of the very few ways by which the institution can be sure of reaching most of the students in the main target groups (usually working adults, spread over a wide area). Television and radio allow students to be primarily home-based, or at least locally based. It has already been noted that for most distance-teaching institutions, television and radio are useful not so much because they bring in numbers, (although size does reduce unit costs), but more because they reach students in their own locality or home.

ii. Publicity and recruitment. Broadcast media provide a shop window for the institution, enabling information about the distance learning system to be quickly and widely spread amongst a large section of the population, and keeping the institute constantly in the attention of the general public.

iii. Variety, enrichment and motivation. Television, and to a lesser extent radio, are, it is argued, inherently more interesting and stimulating to the target audience than print; broadcasts keep the student motivated and provide variety and alternative routes to learning. There is some evidence from the Open University which both supports and challenges this view. Several studies (e.g. Koumi, 1975; Brown 1980) have identified considerable individual differences between Open University students in their preferences for learning from different media and in different ways (learning strategies). Providing a variety of media therefore is likely to satisfy a wider range of students, and therefore should help keep more students in the system. On the other hand, other studies (e.g. Marcus, 1980) have shown that Open University students are more likely to value programmes if they deal in a serious manner with key issues in the courses, than if the programmes merely provide enrichment or background information. The motivational value of broadcasting therefore depends on the actual educational function chosen for the programmes in the context in which they are used (i.e. on tactical reasons); television and radio do not automatically motivate, irrespective of their use.

iv. Pacing. It has often been argued that the regular timing of the broadcasts keeps the students working to schedule, and prevents them getting behind and hence discouraged with their studies. In fact, there is little evidence for this. Studies by Gallagher (1975) and Bates (1975) have demonstrated quite clearly that what keeps students on schedule in the Open University is the timing of the tutor-marked assignments. Indeed, if broadcasts are out of phase or clash with the assignment schedule (for instance, if they do not deal with the topic on which the student is currently preparing an assignment), students often do not bother to watch or listen to the programmes, preferring to concentrate on their essays.

These four arguments were all put forward by one or more of the twelve institutions, but it seems that the main strategic argument is access, with publicity and recruitment also being important.

b. Tactical Functions

However, merely providing broadcasts for students is clearly not enough. For students to make use of and benefit from the programmes, the broadcasts must have a relevant educational function in the context of the specific course of which the programmes are a part. These tactical functions will vary for each teaching sequence and it is identifying these tactical functions, and analysing their importance, that has proved to be one of the most difficult tasks for course designers wishing to use audio-visual media.

Athabasca University reported that they had no real useful theory of media roles. Everyman's University reported the use of media depended very much on the personalities involved. NFU, Norway reported that so far, few trends have been found; the role varies from one project to another. The Open University said that in the end, it comes down to a producer and an academic going off together to decide what will go into a programme. NURT, Poland reported that one of their main problems was choosing more suitable lecture contents serving the needs of students. Perhaps the clearest statement of the problem comes from Beardsley (1975), reporting on the now defunct Free University of Iran:

> "At the beginning of the strategic planning phase, it was hoped - a rather naive expectation in retrospect - to find a set of practical

> procedures, based upon sound psychological and pedagogical foundations, which would allow the planners to define overall objectives for different media used by the university, and which would serve as guidelines for the selection of media between and within individual programmes and courses. In the event, there was considerable high-level discussion of abstractions, and no significant criteria were elucidated. A series of difficult analyses were often found to end in some commonsense decisions. In the last resort, the selection of media in the Free University was guided by several non-pedagogical factors: ignorance, logistics and external politics."

Clearly, this is a serious problem, for without strong teaching reasons, it is difficult to justify the use of television and radio. Yet there is evidence that television and radio are more valuable when used in some ways rather than others. As long ago as 1973, the Open University produced a list of 25 functions for television and radio based on the justifications used by course teams and accepted by th Univesity's Broadcast Allocation Committee, when television and radio resources are requested for a course. An updated version of this list, including functions for audio-cassettes as well, is included in Appendix 4. A number of these functions were also mentioned by other institutions. For instance, television was used for:

- demonstrating chemical and mechanical processes and experiments in science (Allama Iqbal; Everyman's; UNA, Venezuela)
- demonstrating cultural phenomena and real-life situations (Allama Iqbal; UNA, Venezuela)
- visits to places not otherwise accessible to students (Allama Iqbal)
- demonstrating activities to be carried out by students (UNA, Venezuela)

- illustrating principles related to motion or space (UNA, Venezuela)
- teaching sign-language for the deaf (NFU, Norway)

For radio, Allama Iqbal mentions the use of talks, discussions, drama and serials, while the use of radio for speeches by well-known national figures and for field recordings of people concerned with adult education in Tanzania is also mentioned (British Council, 1980). Beardsley (1975) also mentions the use of radio at the Free University of Iran for feedback and remedial purposes. Theroux (1978) provides an excellent list of possible functions for radio in non-formal education and the Open University has prepared a series of multi-media packages, providing video, radio and audio cassette examples of the main functions listed in Appendix 4, in each faculty area, together with accompanying handbooks discussing the relative merits and difficulties of using the different media in these ways. Meed (1974) has also identified a wide range of functions actually used for radio at the Open University.

Recently, there has also been an important theoretical development. Salamon (1979) has argued that different media "code" or represent information in unique ways, and he has attempted to relate this to the way people learn and think. His theory suggests that while content can be conveyed equally well through any medium, the way that people think about and use that content or knowledge is very much influenced by the media of presentation, and that some media have advantages over others for developing certain kinds of learning skills. Interestingly enough, several of the learning skills he describes as being amenable to development through television are very similar to the kinds of functions for television listed in Appendix 4.

Research and Training Needs

It is quite clear that most distance- learning institutions would benefit considerably from an inter-change of experience in the relative teaching roles of different media, and from the development of a theory of media selection. However, even then, there would be major problems to overcome. First of all, although Salamon's work is a beginning, much more needs to be done before there is a useful theory of media selection. This seems to be a crucial area for research, but it has to be accepted that this is an area of high risk, where many have tried but few succeeded. Secondly, even when a more pragmatic approach is adopted, and a list of functions along the lines of Appendix 4 is developed, there are major problems in applying such general principles to the making a specific programmes. For this to happen both producers and subject specialists have to be aware of such principles, and know how and when to apply them. Producers in particular are likely to be sceptical of any theoretical attempts to match appropriate media to specific teaching functions or learning activities. A quote from a senior BBC/OUP producer illustrates the point:

> "One might also ask, were a course designed in which the media were perfectly matched to objectives, would it necessarily be an interesting, attractive course to those who have to study it? Teaching is an art as well as a science and technology. The more we know of the latter two, the better, but meanwhile many teachers do very well because of their skill at the art, and that art will include, in our case, a 'feel' for the choice of media".
>
> Taylor (1979)

At the workshop, it became clear that both the strategic and the tactical reasons for using audio-visual media were very much dependent on "local" rather than "universal" factors.

With regard to strategic reasons, the decision whether or not to to use television for instance was sometimes beyond the control of the distance learning institution, once established. The Open University for instance has a formal partnership relationship which *assumes* that large quantities of television and radio will be available. These media are built into the system. For developing countries, the use of mass media, particularly radio, is seen by many as the *only* way to reach priority target groups such as adults and school drop-outs in any significant numbers. The decision whether or not to use television in *principle* often pre-dates the setting up of the institution, may be taken at a governmental rather than institutional level, and may be based on political factors or on the results of pressure or resistance from broadcasting organisations. Other institutions, however, particularly smaller institutions in more developed countries, such as Athabasca or Everyman's, have been able to remain flexible in their decision-making about whether or not - or even how much - television or radio will be used. It does seem that the more recently formed distance learning systems have been cautious in their use of broadcast media, avoiding being locked into a system by which they are forced to use these media. The reasons for this caution are not difficult to find: a belief that the high *cost* of broadcasting can be justified only where large numbers of students are likely to be reached; and in a number of institutions, the belief that broadcasting organisations do not understand the requirements of educational programming, and therefore might make programmes that are not appropriate to the needs of the students.

With regard to *tactical* reasons, there was a good deal of sceptism amongst the workshop participants about the practical value of developing theoretical frameworks for deciding on the choice and use of media in learning systems. Each institution was different from any other. They differed in terms of the courses on offer, target groups, physical distribution arrangements, financial arrangements, relationship between broadcasters and academics, experience in the use of media for teaching, time available for programme making, and the relative importance of each medium in the system, yet all these factors influence decisions about how to use different media. It was clear therefore that it would be very difficult to produce general sets of principles about the most appropriate uses of television and radio that would apply to several distance learning institutions.

However, it does seem clear that planners and academics are often *looking* for such principles (is television "better" than radio? What are the "best" subjects to teach by radio rather than by television?) There does therefore seem to be a need at a *policy-making* and initial *planning* level for government administrators to be aware of the *range of factors* which may influence the appropriateness of using certain media in distance learning institutions, so that they can then take these factors into account and apply them to their own conditions. There are now sufficient distance learning institutions eastablished for these *influencing* factors to be clearly identified, either through case-studies or from the literature, and for this to provide a basis for training.

Secondly, there does still seem to be a need even within well-established distance learning institutions, to improve communication and understanding between broadcasters and academics. In many institutions, broadcasters responsible for producing programmes are not experts in the subject matter. Even fewer have specific training in teaching methods. But perhaps training needs are even greater for those responsible for the academic *content* of courses. If there is to be a trend towards greater flexibility for the academics or subject specialists in deciding whether or not - or which kinds - of audio-visual media to use, subject specialists need to be aware of the *educational potential* of audio-visual media, and this requires some understanding of how audio-visual media differ from print media in the way knowledge is presented and skills developed. The problem is well put by the Rector of the Spanish Open University, Diez Nicolas (1976);

> "The main difficulty for the use of audio-visual aids is not to be found in the technical media as such but rather in the lack of contents. It is therefore necessary to train the teachers in the use of educational technology so that they learn to express themselves and to communicate with the students through these technical media."

This problem is particularly acute in those institutions, such as SLIDE, and UNED, Costa Rica, which are heavily dependent on external consultants for the preparation of teaching materials. Thus there appears to be an urgent need to find ways in which to bring people together with appropriate experience in different fields, in a meaningful working or training relationship. Planners in particular need to be aware of this need, if the advantages of audio-visual media are to be fully exploited, and if a waste of scarce resources is to be avoided.

IIEP could assist in several ways. At a governmental and initial planning level, the special requirements and features of distance learning systems need to be understood. In particular, with regard to audio-visual media, planners need to be aware of the factors which will influence initial decisions about the selection of media and relationships with broadcasting organisations. Planners also need to be aware of initial decisions about the structure and organisation of distance learning institutions. These initial decisions will influence the way decisions will be made internally about the use of media. Secondly, there is a need to assist managers within distance-learning institutions to provide appropriate means of bringing together academics, experts in teaching methods, and media specialists, and to provide joint "in-house" training programmes in order to increase awareness of each others potential and needs. Thirdly, there is a role to be played in exchanging experiences between different institutions in the use of different media. Care has to be taken in bringing together appropriate institutions, but distance teaching methods themselves could be used to improve communication between institutions, such as the exchange of internally produced multi-media training materials.

It is clear that the issue of how to select and use different media in distance learning institutions is increasing rather than decreasing in importance. The trend towards courses for relatively small numbers of students, the high cost of broadcasting, the development of new micro-processor technology and the increasing use of low-cost audio-visual media, such as cassettes, is forcing course designers and managers to think very carefully about why certain media are being used rather than others. The issues are complex, and the need for training and research is acute.

5. TRANSMISSION AND DISTRIBUTION

a. Difficulties

Every one of the twelve institutions expressed concern at the difficulty of distributing audio-visual materials. The difficulties are not always of the same kind, but several institutions have more than one kind of difficulty:

i. Lack of adequate coverage. Neither Sri Lanka nor Tanzania (at least on the mainland) yet have television. Three institutions (Athabasca and Allama Iqbal with television, IAE Tanzania with radio) have difficulty because substantial numbers of their target groups cannot receive the transmissions. In Pakistan, many homes do not have television. To make television more widely available, Allama Iqbal is considering providing communal sets in villages, but this will bring additional problems of providing adequate maintenance and security. In the case of Athabasca, not all students live in areas where the local broadcast station or cable channels carry their programmes. In Tanzania, the national radio service does not reach all parts of the country yet. SLIDE does not yet have access to the national radio system. In the more developed countries, access to or ownership of audio-cassette machines was high (over 75% by students at Athabasca, Everyman's, N.F.U. Norway, Open University) but this was not so in the other institutions, although some such as UNED, Costa Rica and Lesotho DTC, were making cassettes available at local centres.

ii. Complexity of timetabling. Both Athabasca and Costa Rica have to use several different transmission agencies, so that the same programme is distributed at different times in different parts of the country. This causes administrative difficulties for the distance learning system. The Open University also has a regional problem, because arrangements for transmission of television and radio in Scotland and Wales are different from those in England. Consequently, special arrangements have to be made for Scottish and Welsh students.

iii. Displacement. The Open University is increasingly suffering from the displacement of programmes from their regular times to other less common times. Originally, this happened due to the desire of the BBC to give special coverage to significant events, such as World Cup football, Wimbledon tennis, or the Olympics, but with the impending establishment of a second rival commercial channel, the BBC has begun general transmissions 25 minutes earlier as an "experiment" during the first six weeks of the academic year. This has meant that it is no longer possible during these weeks to transmit foundation course programmes to coincide with the opening hours of local study centres. In 1980, 20% of all Open University programmes will suffer from displacement, with the inevitable effect of students missing programmes and having study schedules disrupted.

iv. High transmission costs. Rather surprisingly, this was not a general problem among the twelve institutions, although it can be a serious problem for some distance learning systems. Both Allama Iqbal and NFU, Norway have to find substantial amounts from their own budgets for transmission costs to broadcasting organisations. Allama Iqbal, for instance, is charged commercial advertising rates for radio (which makes radio programmes more expensive per minute than television!) The Open University also has to find a substantial amount, but it is still a small proportion of the overall broadcast budget. NFU, Norway, is perhaps unique, because it is charged per hour of transmission, on a basis which incorporates costs for production and overheads, as well as for transmission. This is a strong disincentive to run the same programme for several years, as the cost will be the same, whether a totally new programme is made or not. Several institutions, however, paid no transmission costs, even though in some cases they were using commercial networks.

v. Insufficient quantity of transmission time. This is a general problem, and one which seems likely to get worse, as the institutions increase the number of courses available. At Everyman's University, already not all programmes made get transmitted. The Open University, in its evidence to a government commission, claimed that it would eventually require over 50 hours a week television transmission time. Goodenough (1978) calculated that the Free University of Iran would eventually have needed between 6 to 10 hours a day transmission time for each medium. Clinch (1979) estimated that Allama Iqbal will soon need 20 hours a week radio transmission time for 39 weeks a year. It is clear though that broadcasting organisations generally are reluctant to make such large amounts of time available. Given that most courses are planned to run for a minimum of at least four years, and the substantial increase in the number of courses to be made available in the future, demand for transmission time seems almost certain to exceed the supply for many of the twelve institutions This could be a time bomb ticking away inside a number of distance learning systems.

vi. Inadequate quality of transmission time. This is perhaps the most serious difficulty of all. It is not so much the overall quantity of time required that is the problem - broadcasting organisations are usually willing to transmit at otherwise "dead" hours - but getting a sufficient quantity at times that are convenient for students. For instance, programmes transmitted before 7.00 a.m. or before 5.00 p.m. will not be watched by more than 20% of Open University students. While quite useful as repeats, such times are useless for single transmissions. However, the times most useful for working adults are precisely those when broadcasting organisations are seeking to reach their prime audiences with general broadcasting, or at least broadcasts with a more general appeal. The case of distance-learning systems is not helped by the comparatively small numbers of students following individual programmes. There are only three national broadcast television channels in Britain. One is used to transmit 173 programmes a year to courses with less than 100 Open University students - hardly an effective use of a scarce national resource, unless the programmes are broadcast at times when nobody else wants to watch.

The accessibility that broadcasting brings is perhaps the major single justification for using television and radio in distance learning systems. It is therefore very serious if the distance learning institutions and the broadcasting organisations between them cannot plan or manage their systems so as to ensure that the majority of the students can view and listen at convenient times. It is perhaps worth pointing out that the responsibility for this probably lies more with the distance learning institution that with the broadcasting organisation. Broadcasting organisations will be more than happy to produce as much material as the distance learning institutions are willing to pay for; however, there is a physical limit to transmission times, and broadcasting organisations have to consider their obligations to the public as a whole. It is up to the distance learning institution therefore, before commissioning production, to ensure that there is likely to be a balance between the amount of material and the means available for distributing it.

b. Planning strategies for dealing with transmission difficulties

There are several strategies available for dealing with transmission difficulties. There is not sufficient space to go into detail here. This section is further elaborated in Appendix 5, but the main strategies available are described briefly below:

i. Avoiding or supplementing conventional broadcast transmission

In this strategy, alternatives to normal transmission facilities are sought. Several alternatives are available in theory:

- cassette distribution: cassettes (audio or video) are distributed either directly to students' homes or to local centres with the necessary replay equipment. This strategy is already used by a number of distance learning institutions.

- night-time transmission and automatic recording: programmes are broadcast in the middle of the night or at other times when there would otherwise be no broadcasts; by means of a time-switch, recorders are automatically switched on, and record the programmes required. Such a scheme has been suggested both in NFU, Norway (for video) and in the Open University (for audio).

- satellite transmission: a direct broadcasting satellite could make available enough television and radio channels for one of each to be dedicated solely to educational use; satellite transmission would provide blanket coverage for a whole country, or even several countries within a region. Satellite transmission has already been used for educational purposes in the U.S.A., Canada, and India, on an experimental basis, and operational direct broadcast satellites are being seriously considered in several countries with distance learning systems (Canada, Brazil, Norway, United Kingdom, Australia, France, West Germany, Philippines).

- national educational broadcasting channel(s): a national broadcasting channel dedicated solely to education, culture or development. Costa Rica already has one such channel for television, and is planning another for radio. Thailand is building its own national educational radio channel.

II. Removing repeat transmissions. Some organisations (such as the Open University) begin by broadcasting each programme twice, but as the number of courses with broadcasting increases, there are too many programmes to be fitted into the transmission time available to allow each programme to be broadcast twice, so gradually more and more programmes become transmitted once only.

III. Increasing the quantity of transmission times at "off-peak" hours

As more programmes for transmission become available, it is often possible for broadcasting organisations to find extra transmission times at hours when there would otherwise be no broadcasts, usually at less popular times but when most students will usually be at home (e.g. early morning).

iv. Sophisticated scheduling procedures. To enable awkward decisions to be made about which programmes should lose their repeats or be broadcast at poorer times, sophisticated scheduling procedures can be used to ensure that students' learning is affected as little as possible, by quantifying the quality of different times and the value of the broadcasts on each course, on the basis of audience research. This procedure is used in the Open University.

v. Reducing the life of programmes. The longer the life of programmes, the more transmission time that is required. By extending the life of its courses from a planned four years to eight years, the Open University doubled the amount of transmission time it required. The life of programmes could be shortened either by shortening the planned life of courses as a whole, or by remaking programmes before the end of the course. This would enable planned levels of production to be kept up, without requiring so much transmission time. In effect, it shifts the balance from new programming towards more remakes.

vi. Clearing deadwood. Those programmes which after the first year of presentation are found not to be useful are removed from the course (and not replaced), freeing transmission time for repeats of more useful programmes. This idea is being investigated on an experimental basis at the Open University.

vii. Making broadcasting optional. This solution accepts the view that transmission and distribution of audio-visual media will always be a problem. It will never be possible, so it is argued, for all students to be able to see or hear the programmes. Broadcasting should therefore be made available as an optional resource for those students who can and want to use it - just like extra reading, or, in a number of systems, face-to-face tuition. Although not stated as such, this seemed to be a strategy adopted by most of the twelve institutions (the clear exceptions being Maranhão and NURT, Poland).

viii. Matching production to transmission. The level of production (or bought-in material) is geared to both the quantity and the quality of transmission time available. If subsequently the transmission agency has to reduce either the quantity or the quality of the transmission times available, then production (or the life of the programmes) is also reduced, to ensure that high viewing or listening levels can be maintained. No institution appears to have adopted this strategy so far, although the Open University is trying to negotiate such an agreement with the BBC for its new contract.

The advantages and disadvantages of each of these strategies, and further details of the techniques that have been developed, are examined more closely in Appendix 5. From this examination, several general conclusions can be drawn:

1. Obtaining adequate transmission facilities is one of the most serious problems facing distance learning institutions. The main justifications for using television and radio - their accessibility to students, and their potential for providing unique teaching functions and learning experiences - are completely nullified if the programmes are transmitted at times when substantial numbers of the target audience cannot, or are not prepared to, watch or listen to them. It has to be faced though that very few of the twelve institutions in this study could be sure of getting the majority of their broadcasts seen or heard by at least three-quarters of their target audience.

2. Several different strategies can be used to improve the accessibility of programmes, and some of these strategies are not dependent necessarily on the good-will or co-operation of other agencies. Distance learning institutions do need though to explore fully the range of options, if they wish to improve the accessibility of their audio-visual materials.

3. Some of these strategies require sophisticated techniques, but there is now a good deal of experience built up in one or two institutions in the development and application of these techniques

4. Sometimes, solutions to the transmission problem proposed by broadcasting organisations, although reasonable from the broadcast organisation's point of view, are not necessarily the most suitable from the point of view of the distance learning institution. It is important that distance learning institutions develop or have access to their own expertise, and have suitable, internal decision-making frameworks that enable them independently to assess the strategy which would best serve their needs.

c. Implications for training and research

It would be a mistake to consider transmission arrangements as merely a technical problem or a problem created by broadcasting agencies. The suitability of transmission arrangements is determined as much by policy decisions made within distance learning institutions, as by decisions made by broadcasting organisations about the amount and quality of times they are willing to make available. Secondly, when courses are expected to last as long as four years or more, and when the total number of courses available is expected to increase year by year, there are major long term implications for transmission times which are not always obvious.

The Open University is an example of an institution which has now found itself in serious transmission difficulties as a result of policy decisions made (or rather avoided) several years ago. Other institutions seem to be seeking production facilities without considering adequately how programmes produced will be distributed, without considering how many students will be able to watch such programmes, and without considering the likely cost-effectiveness of such distribution arrangements.

At the same time, there is now a great deal of experience and knowledge developed about those issues, which could well be made available to managers in the newer institutions, and to planners of new distance learning systems. Some of these issues require a consideration of the implications of policy decisions; some are more technical solutions to the difficulties many distance learning institutions face in getting their programmes transmitted, when previous policy decisions have already been implemented. Particularly in the area of radio and cassettes, there are situations where one distribution system has clear economic advantages over another. Once again, this kind of knowledge needs to be disseminated between institutions in such a way that it can be applied to the problems facing different kinds of institutions.

Finally, related to the question of obtaining suitable transmission times is the failure so far of most distance learning institutions to attract really mass audiences. Broadcast television and radio are scarce resources, and in many countries, rightly or wrongly, their main function is considered to be the provision of entertainment. Unless the challenge of producing educational programmes with mass appeal (such as those made by Children's Television Workshop - "Sesame Street," "The Electric Company," etc.,) can be met by distance learning institutions, they must expect to receive a good deal of transmission time at inconvenient hours for working adults.

6. THE PRODUCTION OF BROADCAST MATERIALS

a. Technical Difficulties

Technical production difficulties - a lack of well-qualified production and engineering staff, poor equipment, inadequate maintenance facilities, a shortage of spares, and just not enough money - are still a problem in several of the institutions, notably Tanzania, Allama Iqbal, Lesotho, Mauritius and Maranhão. These problems probably transcend any others in these institutions. Without adequate minimal resources, it is difficult to see how even the most brilliant or sophisticated management procedures can make broadcast media effective in distance learning systems. However, such issues are really outside the scope of the workshop, since there are already existing facilities for technical training, and other channels for obtaining technical and financial assistance. This section therefore concentrates on how production can be planned and managed so that the teaching potential of broadcasts may be fully exploited, and so that the programmes are better integrated with other teaching media.

b. External or Internal Production?

It was quite clear that most of the twelve institutions were wanting their own production facilities, independent of broadcasting organisations. Half those using radio already produce their own programmes, and in these cases, the broadcasting organisations seemed quite willing to accept for transmission this independently produced radio material.

It is television which presents the most difficulty. None of the institutions except Maranhão had their own, full television production facilities. Costa Rica, Allama Iqbal, and Everyman's either had or were wanting their own pilot or low-cost production studio. Although Athabasca has no desire to produce its own programmes, it is dissatisfied with the service it is getting from the agency responsible for the production of educational television programmes in the Province ("red tape, nebulous, slow"). Consequently, the process of negotiating and producing programmes did not fit in with the time-scale of course design at Athabasca. Goodenough (1978) quotes the former Chancellor of the Free University of Iran, Dr. Ahmadi, who commented on the "limitations and cumbersome nature of the production process" of the National Iranian Radio and Television organisation. Mauritius College of the Air has also commented on the lack of understanding of educational needs by producers in general broadcasting:

> "Educational television production makes special demands on personnel that are rarely completely understood by producers and administrators who have no commitment to education. This kind of production is bottom on their priority list."

However, no matter how much distance learning institutions would like to have their own television production facilities, there are serious disadvantages as well. The costs of equipping, manning and maintaining such a facility are extremely high, and there is probably insufficient demand from the distance learning institution itself to maximise fully such resources. By using spare capacity in external broadcasting agencies, distance learning systems are usually charged only the additional, or marginal, costs involved, if they are charged at all. It can also be difficult for a distance learning institution t find and keep suitably qualified production staff. Because they can usually offer better salaries, higher status, more "interesting" productions, and better career prospects, conventional broadcasting organisations are likely to entice away good production staff. In any case, for constitutional reasons national broadcasting organisations have a monopoly on all broadcast television in some countries, such as Britain and India. A perhaps more contentious argument is that without the expertise of an external broadcasting organisation the full potential of television in a distance learning system will not be realised. It is certainly true that if one has access to the full range of resources at the disposal of a major broadcasting organisation, the range of programmes that can be made, and therefore the range of teaching functions and strategies possible through television, is considerably increased.

What needs to be considered is whether or not the difficulties encountered with external production agencies are just as likely to be encountered with internal production. The problem is that television has a rhythm and a pattern of production which is unfamiliar to most academics and academic administrators, and these production requirements have to be taken into account in course design, if the full teaching benefits are to be obtained from television.

c. Financial Arrangements

Several organisations (or rather their funding ministries) pay for the services provided by the broadcasting organisations (Allama Iqbal, Everyman's, NURT, Poland, and the Open University). NFU, Norway is paying for specific production posts in NRK, the state broadcasting organisation, and will also pay full production and transmission costs. Negotiating a fair payment, particularly when the distance learning institution is having to reduce expenditure generally, is not always easy. Recently, the Open University has placed a cash limit on what it will pay the BBC, in order to keep costs under control at a time of rapid inflation.

It might seem that those distance learning institutions which receive free or heavily subsidised broadcasting are particularly fortunate. However, in practice, this seems to be a mixed blessing. Athabasca considers that one reason for the bureaucracy and delay in getting decisions on programmes is because the cost of programmes has to come out of the educational television production agency's own budget. It therefore has to balance Athabasca's demands against those of all the other agencies requiring television production resources. Goodenough (1978) has pointed out that although there was a generous agreement between the Free University of Iran and National Iranian Radio and Television for all FUI's programmes to be produced by NIRT, there was no cash budget transfer between the two organisations. It is perhaps not surprising then that FUI found it very difficult to get practical co-operation from NIRT, in terms of producers liaising with FUI's course teams, and productio facilities being available at the time they were needed. Goodwill, of course is essential, but when the chips are down, and broadcasters are faced with a conflict of priorities, the obligations that result from a financial arrangement have to be taken very seriously. Countries where less importance is given to market considerations need to develop other mechanisms to enable conflicts of priorities to be resolved in ways that do not leave distance learning systems always at the bottom of broadcasters' priority lists.

d. Working with Producers

The most difficult problem with regard to planninq and management of production is to find satisfactory ways for producers and academics to work together in a creative and constructive manner, so that academics feel they are getting the programmes they want, and producers feel that they are able to be creative and to exploit fully the potential of television or radio.

The most well-known strategy for doing this is the Open University's concept of a course team, in which BBC producers are full and equal members (see Bates, 1975, for a full description of how programme content and style are controlled at the Open University). Although NFU, Norway is planning a similar model, for those courses which will have a broadcasting component, it is perhaps surprising that amongst the other institutions in the study, there were few where producers worked as closely alongside academics from the very beginning of course construction, as equals in a team. At Everyman's for instance, producers are called in to work with a team, if during course construction, the academics decide that the course needs broadcasts. There was criticism from NURT, Poland, of academics providing materials very late for production, and in several institutions,. it did not appear uncommon for broadcast production staff to be called in only when all units are written.

Under such circumstances, it is not surprising that the full potential of the medium is not exploited. Perhaps more importantly, such arrangements do not allow the subject specialist staff to become involved in programme planning, so they have no chance of learning or understanding how to use the media better.

At the same time, the Open University course team model has certain requirements which are often difficult to repl'cate in other institutions.

i. Producers must have a reduced production load, to allow them time to attend meetings and read all drafts of written materials. Consequently, Open University producers have a load of only 6 television and 10-12 radio programmes on average.

ii. Producers are allocated at an early stage to course teams (which in turn requires allocation of television or radio programmes to courses at an early stage - usually at the beginning of course design).

iii. There must be time and a willingness on the academic's side to work on television and radio production activities, and to consider sometimes unfamiliar ideas from producers about how the subject could be taught.

iv. Producers must have a good grasp of the subject material, and a willingness to incorporate academics' ideas into the programmes.

v. There must be roughly equal status between producers and academics, and both producers and academics must be willing to abide by group decisions.

Even at the Open University, it is often difficult to meet or abide by these requirements. Also, Beardsley, (1975), on the basis of his experience at the Free University of Iran, questioned whether the Open University course team idea is exportable, in practice.

> "The well-known individualism of Iranians and their manifest difficulties in co-operating with one other might make it possible to implement fully the course team approach."

It is difficult to see, however how subject specialists will ever appreciate the teaching potential of television or radio unless they are forced by the working environment to come into close and regular contact with producers and broadcast materials. Providing that kind of working or environmental framework, with all the necessary support, such as adequate time, limited and selective use of television and radio, and initial training of subject specialists in the use of media, could be seen as a major responsibility for planners and managers in distance learning systems. The alternative - as practiced in particular by the smaller institutions such as Everyman's and Athabasca - has been to play down very much the role of broadcasting, to depend more on other media.

e. Advance Production Planning and Scheduling

Resource allocations are of two kinds. One is a decision about the overall levels of production and transmission - how many programmes should be made eac year? The other is a decision about how many programmes an individual course should get. Two distinctly different models of allocation of broadcast resour are apparent in the nine institutions. One is based on the very early allocat of resources; the other is based on the allocation of resources as the needs arise, at a later stage in course development.

Those organisations which make early allocations set an overall production target, perhaps even two years in advance, then decide how many programmes each course will get, usually before the course has been designed to any extent. The other organisations, however, first of all decide how many programmes a course needs, as the course is being designed, or even in some cases, after the units have been written, and the sum of all these decisions sets the overall production level for the year. It could therefore not be until the end of the year that the full production load is known. These two models are of course extremes, but nevertheless, some organisations, such as the Open University, clearly go for early allocations, while others, such as Everyman' and Athabasca, clearly prefer to determine production loads as a result of clear demand during course design. NFU, Norway has an ingenious system which appears to be somewhere between the two. A pre-project team investigates the need for broadcasts (and for other media), and then recommends an allocation. The actual project team then works with their allocation.

Generally, broadcasting organisations or internal production departments prefer early allocation decisions. They like to know well in advance how many programmes overall will be required, so that they can staff up and provide regular employment, smooth production loads evenly over the year, and make full use of studio resources. It allows support services such as graphic designers time to prepare work, and it allows producers to be allocated and attached to a course right from the beginning, so that the course requirements can be better understood, and so the producer can have an influence on the use of television and radio in the course.

Generally, academics intensely dislike early allocations of resources. They are asked (if they are asked at all) to make decisions about how broadcasting should be used on a course - or at least how much broadcasting will be required - before they have even considered fully the contents of the course. Having been allocated broadcasting resources, they find themselves faced with schedules from broadcasters which can leave them having to make a programme, whether or not they feel there is a need for a programme at that point in the course.

However, if television or radio are to be used extensively and effectively making can be avoided. Consequently course production schedules will need to take this into account. It then becomes very important to ensure that television radio and print production schedules are carefully synchronised, to ensure that development of each medium can take place at the same time. There is clear evidence from the Open University that a characteristic of courses which have used television very successfully, such as the Maths and Science foundation courses (M101 and S101), is that they have made sure that production of print material was closely linked to production of related programme materials, so that those parts which were carried on television made specific use of the characteristics of television, but were directly relevant to, and an integrated part of, the correspondence text. Producing course material in this way has in fact meant that academic staff have been much more involved in the production of television material, and indeed have had much tighter control over contents, without in any way restricting the creativity and involvement of the producers.

f. New or Adapted Material

Because of the high cost of producing their own broadcast material, several of the institutions (Athabasca, Everyman's, Mauritius and probably NFU, Norway) rely heavily on buying in material from other sources and adaptin it to their own needs. This policy seems to work very successfully where it has been tried. For instance, Everyman's translates science programmes produced elsewhere into Hebrew, and often "sandwiches" bought-in film material with an introductory and concluding panel discussion, to give the material added relevance. ALthough at Everyman's academics can decide as they are producing the course whether or not they wish to use television, before course design begins, they are shown as many existing programmes as possible. One person is employed full-time to identify and order relevant programme material.

At the Open University, on the other hand, producers claim that it is or the course requires, and that in any case it is often just as cheap (given that the production facilities and staffing are already available) to produce from scratch as to buy in and edit previously made programme material.

Certainly, for institutions not already heavily committed to their own production facilities, there does seem to be advantages, in terms of flexibility as well as cost, in buying in materials. However, to enable such arrangements to work, there needs to be an effective cataloguing and ordering system, and in many countries, international mail and customs regulations, not to mention copyright difficulties, would make such arrangements very slow and cumbersome.

g. Implications for Training and Research

Many of the comments made in Section 4 with regard to the educational functions of audio-visual media relate also to the production of broadcast materials, particularly with regard to improving communication between producers and academics. In point of fact, the advantages of external or internal production, the most appropriate working relationship between producers and subject specialists, the advantages and disadvantages of early decisions about the allocation of production resources to course teams, or of using new or adapted materials, again will depend very much on "local" rather than "general" factors, or what is practically possible within the environment in which the distance learning institution will operate.

Nevertheless, it is important that planners and managers are aware of the options available, and the advantages and disadvantages attached to the various options. There also seem to be some principles regarding production of broadcast materials for distance learning materials which do seem to be common across a number of institutions, but which are not always followed:

learning materials, producers (or at least script-writers) must have time to liaise with subject specialists; subject specialists must have time to liaise with producers. This has implications for manpower and costs. It should certainly be borne in mind when determining the number of programmes a year for which a script-writer or producer will be responsible. It will almost certainly need to be less than if they were working in or for a general broadcasting organisation.

2. Levels of programme production should be determined by the number of producers realistically available, and the number of programmes they can make, allowing for the time needed in (1) above.

3. The relationship of programme to texts needs to be clearly thought out before course production begins. Either the role of broadcasts needs to be clear in advance, so that relevant programming can be made as the course progresses, or the content of broadcasts must be known before units are written. Scheduling of production between broadcasts and texts needs to be carefully co-ordinated, so that courses fit together.

4. All this depends on good communication between producers and subject specialists. This needs to be made possible by the organisational structure of the distance learning institute, so that broadcasters - or those responsible for broadcasts - and subject specialists work naturally together.

5. Much more could be done to enable better interchange of material between institutions. Adequate cataloguing systems are essential for this purpose.

Whether or not these conditions can be met will be very much determined by the kind of decisions made by those that set up and manage distance learning institutions.

7. NON-BROADCAST AUDIO-VISUAL MEDIA

The Move to Non-Broadcast Audio-Visual Media

The paper so far has concentrated on broadcast media, because all the twelve institutions use or plan to use either television or radio or both, and because in all institutions broadcasting seems to cause major planning and management difficulties for distance learning systems. It is quite clear though that many distance learning institutions are increasingly using non-broadcast audio-visual media.

The reasons for this are clearly stated by Dr Ahmadi, the Chancellor of the Free University of Iran:

> "......there has been a marked redirection of interest from so-called 'big media' to 'little media.' 'Little media' are proving to be as, if not more, effective than 'big media' in many respects. They are less expensive and complicated to produce and use, and they are educationally effective for many learning tasks that traditionall have been ascribed to 'big media.'
>
> (quoted by Goodenough, 1978).

In addition, new technological developments, particularly in micro-processing, suggest that the range and sophistication of low-cost non-broadcast audio-visual media is likely to increase rapidly in the future. Not only do such developments raise planning and management issues in their own right, but they also have implications for the use of broadcasting in distance learning systems.

Audio-Cassettes

Audio-cassettes have proved to be the major "new" development in teaching media at the Open University. In 1974, there were only one or two courses using audio-cassettes. By 1981, the University will be offering 196 hours of cassette material, equivalent in playing time to 588 radio programmes. .

There are several reasons for the growing popularity of audio-cassettes at the Open Univeristy:

1. Academic staff like them. It is easier for them to integrate cassettes as they design the print material. They can take a tape-recorder, and use it as they produce written drafts. This gives the academic more control in the development of the materials than he has when using radio. Radio scripts tend to get written separately and have to stand "on their own."

2. Educational technologists like them. Cassettes have strong pedagogic features. A cassette can be stopped and replayed as many times as necessary. A cassette allows a student to look and hear at the same time, thereby allowing his attention to be directed to specific aspects of print or other visual media. Cassettes can be used for the development of skills and for mastery learning.

3. Students like them. They are freed from the dependency on set broadcast times, so that cassettes can be used when the students want to use them. Students can have a permanent copy. Cassette players are so cheap that students can afford to buy one, if they do not already own one.

4. The management likes them. Cassettes are easy to produce, to copy, and to distribute. (They are robust enough to be mailed with correspondence texts, without special packaging.) At the Open University, for courses with less than 500 students per annum, it is cheaper to distribute audio-cassettes (which the students keep), than to pay for the equivalent amount of radio transmission time.

However, audio-cassettes are a different medium from radio. They are not just a replacement, but actually serve different teaching functions from radio (see Appendix 4). In particular, they require different production techniques. Although there are advantages in broadcast producers being involved, to ensure a good technical recording, and a good "production," the most effective cassette production style is radically different from that of a radio programme, and broadcast producers need to learn these techniques as much as the academics. There is certainly therefore a need for training materials directed at both academics and producers. Using a wide variety of examples, the Open University has designed an audio-vision training package, which discusses good and bad practice in the design of audio-cassettes.

Video-Cassettes

Where video-cassettes have been used in distance learning institutions, they have been popular, particularly in Athabasca. However, the main disadvantage of video-cassettes is that they have to be used at local centres. Also, if a large quantity of programmes has to be distributed on video-cassettes, costs become very high. Video-cassette production also needs a different style from broadcast production, but because video cassettes, being used primarily in centres, are more likely to be used in groups than audio-cassettes, there is less scope for intensive individual use in the same way as audio-cassettes. On the other hand, group use of video cassettes enables students to draw out much more from the programmes than if students were watching programmes individually. If distance learning systems can collaborate with local institutions which already own video replay equipment, costs can be kept down considerably. However, this requires good contacts at a local level.

Telephone Teaching

Telephone teaching is used extensively in four of the twelve institutions and is proving to be popular both with tutors and students. There are, nevertheless, still many problems. Several of the institutions in the study did not have a telephone system widespread enough or reliable enough to be useful (e.g. Tanzania). Even where there is good national coverage, line quality is often a problem. In some countries (e.g. Norway), it is prohibitively expensive because of problems of distance. It is also clear that special skills from tutors, and discipline from students, are required, particularly where tele-conferencing (connecting up several students and a tutor simultaneously) is used. This again is an area where careful costing is necessary, particularly since telephone charges can easily be "lost" in other budgets, but nevertheless contribute a real cost to the institute.

Possible Future Developments

Several new developments also offer considerable potential for distance learning. Cyclops, an Open University invention, allows for visual as well as aural signals to be transmitted through the telephone system, or recorded on to (stereo) audio cassettes. The sound and vision can be displayed through a standard television set. Viewdata allows access to unlimited information through connecting the telephone and a television set. It also offers the possibility of home-based, computer aided instruction.

Implications for Research and Training

These developments have considerable implications for planning and management in distance learning institutions.

With the range of media rapidly increasing, how do distance learning institutions decide whether or not to make certain media available? In most cases, this will require careful pre-analysis of the costs and of the teaching and administrative implications. It will require decisions about investment in hardware or copying facilities, or whether or not to use external services. It will require some expert advise, and probably piloting and pre-testing on selected courses. In most instances, new media will require the co-operation of regional and local staff. Proper consultation is essential.

If a distance learning institute is to keep up with new developments in technology, it seems that at least five minimum requirements have to be met:

a. In-house research and development expertise. It has to be someone's job to keep abreast of new developments to see what the teaching potential is likely to be, how such a development would fit in to the existing system, what the likely costs and implications will be, and to design pilot and evaluative studies. That person, or group of people, must have either executive authority, or direct access to those that do.

b. Development money. It helps to promote development if there is money not already committed to on-going teaching programmes which can be set aside for trying out new media, on pilot courses.

c. Non-broadcast audio-visual technical service. There has to be some facility independent or free from the demands of regular broadcast and print production, or with spare capacity, which can produce and copy programme material for non-broadcast audio-visual media - a small television studio, a sound recording studio, photographic facility, and video and audio copying facilities. This might be located and even staffed by a broadcast production unit, but it needs to be independent of broadcasting requirements, with its own budget.

d. Suitable management structure for decision-making. Someone, or some committee, has to have power to decide at some point that the new development, if suitable, will become part of the general teaching system and to provide adequate resources to allow this to happen. Once a decision of this kind has been made, some department or group has to be responsible for producing or organising such a service, for dissemination, and for training academics and tutors in its use, etc.

e. Job flexibility. Who will "produce" the new media? These new technological developments make it all the more important to train multi-media educational communicators. Some would argue that broadcasting is already over-professionalised. One of the real advantages of non-broadcast audio-visual media is the control subject-specialists can have over the production of materials. However, even these new media require skills in communication as well as subject expertise. Where broadcasters are already closely integrated with an institution - such as the Open University - it may be possible for people trained as broadcasters to be further trained in the use of non-broadcast audio-visual media. Where broadcasters are completely separate, however, the role of the internal educational technologist becomes increasingly important. It is much easier for this person to take on the role of a multi-media communicator, because he or she has no particular a priori committment to any medium.

Non-broadcast audio-visual media present particular challenges to distance learning institutions in developing countries. Non-broadcast audio-visual media are often simpler to produce, maintain and manage, they can be designed in-house, without being dependent on other agencies or ministries, and they may turn out to be very much cheaper than broadcasting. However, there are four particular disadvantages:

a. New developments, particularly those heavily dependent on micro-processor technology, are likely to be developed and (at least initially) manufactured in developed countries. There will therefore probably be heavy import taxes on the goods. What is cheap in Japan, Europe and North America will not necessarily be cheap in Pakistan, Costa Rica or Mauritius. For instance, while an audio-cassette machine can now be bought in Britain for as little as US $25, the cost in Pakistan is US $120, due to import duties. Thus individual ownership of audio cassette machines is widespread in developed countries, and very limited in under-developed countries.

b. With the rapid development in micro-processor technology, distance learning institutions in developing countries need to be well-informed. It is easy to make costly investment mistakes in this field. There is need to share knowledge and experience in this field, particularly between distance learning institutions in developing countries.

c. There may possibly be greater, initial user resistance to new developments in developing countries. Lesotho reported students' use of audio-cassettes as being half-hearted. There is certainly likely to be less familiarity with new technology in developed countries, although this initial resistance may quickly disappear.

d. because such equipment will not be owned so generally by individuals as radio (and possibly television), it will require provision in local centres, thereby increasing costs to the institution, increasing the difficulties of maintenance and security, and putting more pressure on students to attend local centres.

It is clear then that new developments in non-broadcast audio-visual media will need to be particularly carefully examined in distance learning institutions. Here the need for training and research is very clear. The educational and cost advantages and disadvantages, the practical feasibility, and the administrative and organisational requirements of non-broadcast audio-visual media all need to be explored by all distance learning institutions, but particularly by those in developing countries.

8. COSTS AND COSTINGS

Why Discuss Costs?

At one stage, it was thought that this topic would not be worth discussing, for several reasons. Comparing costs between different institutions in widely different economic systems, with differing ideologies regarding costs, is a pretty meaningless exercise. Secondly, there is an extensive literature on the costs of educational media (see for instance Jamison et al, 1978; special issue of Instructional Science, Vol. 4, No. 3/4). Thirdly, there appeared to be very little in common between the institutions in the way audio-visual media were costed.

However, it became apparent during the workshop that planners and managers of distance learning institutions were very much concerned with the issue of the costs of audio-visual media. They were particularly concerned at the difficulty of making realistic estimates of the "real" costs of audio-visual media (particularly broadcasting), i.e. monies that came directly out of their budget, or monies spent on audio-visual media that might be spent in other ways. They were particularly concerned at the lack of a coherent method of assigning costs between different activities for which the institution was responsible. It was pointed out that the literature on the cost-effectiveness of educational media tended to be pitched at a macro-economic level. What planners and managers within a distance-system required was a better understanding of the micro-economics of distance learning systems, i.e. how they could handle most effectively and most accountably their own internal budgets, and in particular how to know whether or not they were getting value for the money their institution was spending on audio-visual media.

The Methods of Costing within the 12 Institutions

In no area is there greater variety. Table 2 (next page) sets out the basic facts for the eight institutions which provided information in a comparable manner.

Table 2: Costs for Audio-Visual Media in 12 Distance Learning Institutions

All costs converted to US $ (rounded to nearest 1000)

N/a = not applicable (i.e. medium not used)

	Allama Iqbal, Pakistan	Athabasca, Canada	ETV Maranhão	Everyman's, Israel	I.A.E. Tanzania	Lesotho LDC	Mauritius C.A.	N.F.U. Norway	N.U.R.T. Poland	Open Univ., U.K.	SLIDE, Sri Lanka	U.N.E.D., Costa Rica
TV production	82,000	15,000	Information not provided	Information not provided	N/a	N/a	51,000	(500 per minute)	Information not provided	11,453,000	Not applicable yet	75,000
transmission	58,000	40,000			N/a	N/a	Nil			1,608,000		Nil
Radio production	13,000	10,000			1,000	23,000	(See TV)	(100 per minute)		1,186,000		-
transmission	77,000	Nil			Nil	Nil	Nil			143,000		-
Audio cassette production	N/a	20,000			N/a	9,000	N/a	(2.5 per cassette)		?		65,000
distribution	N/a	Nil			N/a	600	N/a			200,000		?
TOTAL A/V COSTS	230,000	85,000			1,000	32,600	51,000	?		16,490,000*		140,000
% of total costs	10%	2%			2.5%	12%	18%	?		19%		3.5%

*includes $1,901,000 overheads non-attributable directly to production or transmission.

A number of points arise from Table 2. The first is that (apart from ETV Maranhão and NURT, Poland) no institution spent more than a fifth of its budget on audio-visual media. Three of the eight institutions spent less than 5% of their budgets on audio-visual media. Secondly the Open University is clearly a very different animal from the rest. Even allowing for differences in manpower and equipment costs, the Open University spends much more on broadcasting than other institutions by several orders of magnitude. The total budget for ETV Maranhão is around $5.6 million, including curriculum development and print costs. The only other institution likely to approach the Open University in terms of costs would be NURT, Poland, but no details were available. Lastly, the anomaly of the commercial rates charged to Allama Iqbal for radio transmission is very apparent.

This table, however, hides the enormous variety in the ways in which audio-visual media are costed. There are basically four ways in which broadcasting can be costed, as far as a distance learning institute is concerned:

a. Zero cost. In this case, the service is provided free of charge by the broadcasting organisation. Not surprisingly, no organisatio received all its services from a broadcasting organisation, entirel free of charge. Only one of the eight (Athabasca) was able to use television production facilities free of charge, although Mauritius and Costa Rica received free transmission time. No institution received free radio production facilities, but several (Athabasca, Tanzania, Lesotho and Costa Rica) received free radio transmission facilities.

b. Marginal Costs. In this case, while the full costs of a service etc.,) are not charged, some other charge is made, often the "real" additional cost to the broadcasting service (materials, fees, electricity, etc.,) of providing the extra service. Mauritius for instance, paid $100 for each television programme recorded. UNED, Costa Rica probably is also paying marginal costs. Everyman's puts some of its programmes out to tender to various production companies, so it is possible in some cases that only marginal costs (for the production company) were quoted, in order to obtain the work. The Open University pays marginal costs for television and radio transmissions.

c. Full costs. Where payment is made to a broadcasting organisation, costs might include at least a contribution to the wide range of services provided within a broadcasting organisation, such as copyright, legal services, access to film or sound archives, etc., and will almost certainly include the overheads involved in providing production facilities (staff costs, equipment costs, studio facilities, rent etc.) Allama Iqbal (for television), NFU, Norway, and the Open University are paying full costs to their broadcasting organisations. Alternatively, an institution will be responsible for its own production (and sometimes distribution), and will have to cover the full costs from its overall budget. ETV Maranhão was in this position for both television production and transmission, and Allama Iqbal, Athabasca, Everyman's,Tanzania, and Lesotho were in this position regarding radio production.

d. Market costs. These are the costs any institution, organiser, or advertiser would have to pay to use a transmission facility at a certain time, if the station operates on a purely commercial basis, in that it aims to charge what the market will bear.

The only institution of the twelve in this unfortunate position is Allama Iqbal, regarding radio transmission.

There seems to be no apparent underlying reason for these wide variations in costing practice. Each case appears to be a result of very local circumstances. Part of the variation is obviously due to the relationship with the local broadcasting organisation. However, commercial stations can be just as "generous" as state broadcasting organisations. Thus in some ways distance learning institutions are dependent on other agencies, such as the broadcasting organisation, for determining their budgets. However, in some cases, the broadcasting budgets are more visible and "known" within an institution (because of the relationship witn an external, broadcasting organisation) than other budgets. For instance, costs of telephone teaching can be more easily "hidden" under other headings.

Part of the problem is clearly the difficulty of knowing what to count as a cost. For instance, the Open University is supposed to pay the full costs of broadcasting. Around 80% of its budget to the BBC can be classified as "overheads" or fixed costs - costs which must be paid, irrespective of how many programmes are made. This is because staff have been recruited and facilities provided specially for the Open University's operations. Once this kind of arrangement is entered into, the University's room fro manoeuvre is limited. With nearly 80% of the budget tied up with fixed costs, reducing production levels will not lead to much in the way of savings, and will in fact substantially increase the average unit costs of those programmes that are produced.

However, the Open University is unique among the twelve organisations in terms of the size of its output and the size of its budget devoted to broadcasting. Where distance learning institutions are requiring a smaller output, which can be met from any spare capacity or from a marginal increase in activity, it would be unreasonable to expect them to pay for services on the basis of full costs.

In practice though, particularly where there are monopoly arrangements, distance learning institutions are very much dependent on the good-will of the broadcasting organisations in obtaining production or transmission facilities, and therefore have little influence in determining the basis of costing. It is therefore important, particularly for those planning new distance learning institutions, to be aware of the wide variety of possible costing arrangements, so that in negotiations with broadcasting organisations, an arrangement appropriate to the particular situation can be agreed. There is clearly more than one example where a distance learning institution is paying through the nose for its broadcasting facilities. It is equally clear that one or two distance learning institutions are getting a very good deal indeed.

Finally, while there are numerous case-studies which provide a global analysis of the costs of individual distance learning systems, there are virtually no studies which attenpt to provide managers within institutions with costing models based on monies which are within their powers to move from one area of activity to another. For instance, it is no help to an internal manager to be provided with a cost model which tells him that broadcast transmission costs $x million, when the service is provided free to his institution. Similarly it is no good telling a distance learning institution that it can save £x million by reducing production levels when 80% of the costs are fixed.

What managers would like to know is how much it would cost (or save) to distribute a certain number of programmes on cassettes rather than make radio programmes, and what the effect would be on the number of students likely to use them, and their relative educational effectiveness. In other words, what are the relative costs and educational advantages of marginal changes in relatively fixed systems? Some examples of how to *measure* such costs and the effects on student usage, with a description of administrative implications, and any information on relative educational effectiveness, would be of considerable practical help.

9. FEEDBACK, INSTITUTIONAL RESEARCH AND EVALUATION

The Use of Feedback in the Nine Institutions

The terms "feedback," "institutional research" and "evaluation" are used in this section in three specific and different senses. Feedback refers to information fed back from students and tutors about the teaching materials, or the teaching system in general. It might be informal, through meeting students, or it may be more organised, such as information collected by questionnaire from a representative sample of students. Institutional research is concerned with a wide range of systematic attempts to find out how to improve distance teaching within the institution. Systematic (as distinct from informal) feedback is important for institutional research, but institutional research is concerned with other aspects as well, such as possible new developments or the identification of more general principles, which might be applied to new course design. In other words, it attempts to be more scientific. Evaluation refers to any attempt to pass judgement on the quality of materials or on policy and management decisions, or on administrative procedures. Thus sending out materials for comment by external assessors would constitute evaluation, but not necessarily institutional research. Viewing and listening figures would constitute feedback and institutional research, but not necessarily evaluation, unless some conclusions were drawn about the programmes as a result. Talking to a students at a party might be feedback, but it would not be institutional research, nor need it be evaluation.

Feedback is the eyes and ears of management. It is generally recognised in distance learning institutions that feedback needs to be systematically organised (in which case it becomes part of institutional research), because there is little or no direct contact between course designers and central managers on the one hand, and students and tutors on the other.

Although the importance of systematic feedback is recognised, few of the twelve institutions have organised to any extent regular systematic feedback specifically on the audio-visual components, and hardly any has a programme of institutional research in this area.

It is not surprising, perhaps, that the major institutional research activity is at the Open University. With an annual bill from the BBC of £7.5 million (U.S $17.5 million) for broadcasting alone, it is not difficult to justify further expenditure on a "core" group of four full-time researchers concerned solely with institutional research into audio-visual media. The value of such work, however, for the planning and management of audio-visual media can be seen from the work of this group.

At the end of each academic year, the group carries out a student survey of all new courses (or courses where major changes in broadcasting have occured The survey collects information about viewing and listening figures, students' use of other media, students' ratings of the helpfulness of different media, and student access to media. The survey data are used for several purposes:

1. to measure the effect of broadcast policy decisions (such as the removal of repeats);
2. to identify the quality of transmission times, for negotiations with the BBC over air time;
3. to identify subject areas where broadcasting has proved itself to be consistently useful - or consistently of low value - in order to help the University's Broadcast Sub-Committee to decide on the number of programmes to be allocated to courses in different subject areas;

4. to help decide on the allocation of transmission times to the various courses;

5. to provide faculties and senior BBC producers with information on the comparative reactions to television and radio on courses in the same faculty, from which sometimes deductions can be made about successful strategies for television and radio;

6. to observe trends over several years in students' use of and reactions to different media;

7. to predict likely future problems and difficulties (e.g. the likely need for either increased transmission times or a video-replay facility in three or four years time)

8. to provide reliable information on the use and value of broadcasting when providing evidence to government commissions or negotiating with Ministry of Education;

9. to provide reliable empirical data on the value of broadcasting in relation to other media, when deciding on resource allocation within the University.

As well as the broadcast survey, the group also carries out in-depth research into individual programmes to identify student learning difficulties, the relative effectiveness of different uses of television and radio, and ways to make certain kinds of programming more effective. This work is done with individual producers and course teams, in an attempt to help producers and academics improve their use of broadcasting on future courses. This year, as an experiment, all courses are being reviewed after their first year of presentation, to see whether any components could be dropped altogether, or whether with some modifications the planned course life could be extended. The research group collates all the data on broadcasting on that course for the review. The research group is also commissioned by the University to carry out specific studies, particularly with regard to evaluating or piloting new media developments, such as video cassettes or Cyclops.

Such an extensive research programme specifically on audio-visual media can only be justified when resources are used on audio-visual media on the scale of the Open University (although it may be worth noting that even the OU's research team is quite small - four academic research staff).

Nevertheless, most of the other eleven institutions had made some efforts at systematic evaluation. Seven of the twelve institutions currently had staff employed full-time on institutional research activities. (Allama Iqbal, Athabasca, Everyman's Maranhão, Lesotho, NFU Norway, Open University). Mauritius did have a full-time researcher, but this post has now lapsed. In most of the cases where there are full-time researchers, the research team obtained student feedback on courses in general and these enquiries would include questions on the media (such as the suitability of the transmission times).

Two institutiona (Allama Iqbal and Lesotho) regularly pre-tested audio-visual materials before transmission and both claimed this led to substantial amendments to the programmes. Two others (Everyman's and the Open University) have on occasions pre-tested audio-visual materials. Althoug it does not use pre-testing on a large scale, the Open University research team is committed to formative evaluation, by conducting research on exisitng programmes, the results of which can be fed into the design of new courses. Costs Rica, SLIDE, with regard to cassettes, Everyman's, Allama Iqbal and the Open University also have a system of pre-viewing programme material by subject experts and/or educational technologists before transmission, to ensure that the material is appropriate.

Although Athabasca's formal research programme has concentrated on a survey of all students on courses in the first two years, contact between tutors and students is close, and because of the small scale of the system, it is easy to get informal feedback from tutors. Although Mauritius no longer has a full-time evaluation person, it does obtain some evaluative information from its records office and from audience responses, via quiz programmes, etc. Similarly, ETV Maranhão relies on feedback from the monitors, and from examination results, which are analysed by its curriculum development team.

In a number of institutions, single "once-off" studies had been carried out. Research carried out by the Polish Institute for Teacher Training found that NURT's materials were extensively used by teachers. A detailed economic analysis of the ETV Maranhão project has been carried out (Arena and others, 1977) which showed that enrolments and performance in the ETV system were better than for conventional schooling in the area, at lower cost. An evaluation of the English programmes for IAE, Tanzania, found that the programmes were found very helpful by the students, but identified difficulties with reception and finding suitable times. As a result of the evaluation, the language level was modified and an introductory course was added. A research study carried out by the Lesotho Distance Teaching Centre found that fewer than 15% of the target audience were regular listeners, that radio was not a cost-effective support service for these students, and that there was no correlation between listening and actual progress. As a result, it was recommended that programmes for agriculture, book-keeping and mathematics should be dropped and that approaches should be made to the Rural Education Section of the possibility of increasing *non-formal* broadcasting.

Organising Feedback and Research

It can be seen that feedback and institutional research can be extremely valuable aids to planning and management, even - or especially - in distance learning institutions in developing countries. The separation of the course designers from the students, geographically in all countries, and socially and educationally in many, makes it essential to organise regular and systematic feedback. For most institutions, it is easier to combine research on audio-visual media with general course feedback. Also, because of the wide differences between each distance learning institution and the environments in which they work, it is essential for each institution to develop its own system of institutional research. It would be extremely dangerous to try to generalise research findings from one or even several distance learning institutions to others working in a unique way in a unique environment.

Although a majority of institutions have their own research and evaluation staff, they are few in number, isolated from the work of similar people in other institutions, and are working in a very new field, often with a good deal of suspicion and hostility from academics within their own institution. Internal on-going evaluative research within a complex organisation is very different from the large-scale, external evaluations often carried out by international or aid agencies. It requires different skills, and a different organisational framework.

Several of the institutions also reported difficulties in ensuring that evaluative research was carried out, or once established continued. This was particularly difficult in developing countries. Mauritius had found it difficult to find the right kind of person to replace the evaluator who left. Contracted evaluators from Universities or from overseas were too expensive and did not usually understand the problems. They also tended to work on too short a time scale to follow through the findings into action, in terms of improved programming and policy decisions. Under financial pressure, evaluation often disappears, and none of the institutions (not even the Open University) had been able to provide adequate resources to allow evaluative research to investigate the impact of audio-visual media on learning and on knowledge gains.

Implications for Training and Research

There seem to be two clear training needs and one clear research need in this area. One training need is for planners and managers in distance learning systems (and perhaps for those responsible for the budgets of such institutions). They need to be aware of the necessity to provide adequate resources and manpower for systematic institutional research activities, to be aware of the organisational structure required for such research to be effective, to be aware of the implications of evaluative research for the system of course design and management within the institution, to be aware of the various ways in which evaluative research could be organised, so that an appropriate model is adopted, and above all to be aware, by way of examples from existing distance learning institutions, of the benefits that systematic evaluative research can bring.

The second training need is for evaluative researchers themselves. New researchers require training in the methods and implications of on-going internal institutional research. Above all, there is a great need for an interchange of ideas between existing evaluative researchers working in the various distance learning institutions, about methods of conducting and organising institutional research so that results can be made more relevant to improving course design and administration, and research carried out in such a way that the results will be acted on by academic and administrative staff. Their isolation needs to be broken down.

The research need is to explore the possibilities of identifying more useful models of institutional research in the area of audio-visual media, somewhere between the specialised, full-time research group at the Open University (which is clearly inappropriate to smaller distance learning institutions), and the lack of a coherent programme for identifying ways of improving or developing the use of audio-visual media found in a number of the smaller institutions. There are indications that one or two of the smaller distance learning institutions may have found such a model, but more information is really needed.

10. TRAINING AND RESEARCH NEEDS

Training for Whom?

Specific areas of training and research needs have been spelled out in the previous sections. It is left to IIEP to decide whether or not a general case has been made for taking into consideration the planning and management of audio-visual media in distance learning systems when drawing up its future work programme. It is also left to planners and managers in individual distance learning institutions to decide whether or not they ought to engage in greater activity in training in this area. The aim of this section is to examine how best to provide training and research in this area, if it is decided that it is necessary.

First, it seems clear that there are two distinct kinds of target groups. The first are educational planners and managers, Ministry of Education administrators, and broadcasting staff, who will come across distance education in the course of their work, but who will not be working within distance learning institutions. Such people may be responsible for initiating, setting-up, collaborating with, or implementing new distance learning institutions, or, increasingly, will be responsible for budgetary allocations, discussions regarding priorities, overall monitoring, and day-to-day collaboration.

The second group are the planners and managers within distance learning institutions, those responsible for the operation and development of distance learning institutions. It must be remembered that these people have learned their trade the hard way, by experience. Few so far have been trained to do this work. Indeed, many of those responsible for decision-making in this area were previously "traditional" academics, with little administrative training or experience, and even less knowledge of audio-visual media (which may be one reason why they are not used more extensively).

There is much to be said, if training programmes are to be run, for ensuring that educational planners at a Ministry level, broadcasters, educational technologists, and planners and managers within distance learning institutions are brought together for joint training. However, it will be helpful at this stage to keep these two groups separate in discussing training and research needs.

Educational Planners and Broadcast Managers

The main aim of any training programme for this group would be to increase their awareness of the unique demands and requirements of distance learning institutions. This can be highlighted by the story (no doubt apocryphal) that one distance learning institution each year has its building plans queried by the Ministry's architectural department because the d.l.i. has omitted to indicate where its lecture theatres are.

In the area of audio-visual media, there are certain specific features which need to be highlighted, in particular, a greater awareness of:

- the benefits, limitations, requirements, and costs of using broadcasting (a "de-mystification" of the media)
- the wide range of possible models of distance learning, especially concerning the different ways media can be produced and distributed
- alternatives to "straight" broadcasting (cassettes, radio-vision etc.,)
- the unique cost structures of distance learning systems, and the ways in which costs can be estimated, monitored and analysed

thereby avoiding the over-professionalism and organisational problems caused in distance learning systems by three or four different professions (broadcasters, editors, educational technologists, graphic designers) from different backgrounds, working on what should be the same task, but in practice "pushing" their own medium. This would require a training programme which would enable such a person to operate with confidence in all these areas.

How?

Before discussing how, it will be worth examining what is already available in the way of training. A number of organisations, such as the British Council and the BBC in Britain, already provide training in general or educational broadcasting techniques, (although the British Council course is now closing down). These courses are concerned primarily with broadcast production and engineering. The Asian Institute for Broadcasting Development in Kuala Lumpar, Malaysia, provides courses for managers and administrators in broadcasting. The University of London Institute of Education, in conjunction with the International Extension College, provides a course on administration and writing for distance education. The Open University, through its Centre for International Co-operation and Services, used to run courses on distance education, but this centre has now closed down. UNESCO and other national aid agencies frequently send foreign consultants to developing countries setting up distance learning systems, and the Open University occasionally allows staff (in leave time) to visit other distance learning institutions, or to receive staff from other distance learning institutions on attachment, provided there are no cost implications for the Open University. One or two universities (such as University of Massachusetts, and the University of Wisconsin) include a component or credit on distance education in their post-graduate

- the importance of structural decisions regarding the relationship between subject specialists, media producers, educational technologists, and evaluation staff

- the need to make special provision for in-house evaluative research.

It would seem that, given the widespread and growing use of distance education throughout the world a component on distance education within general educational planning courses would now seem to be essential. In addition, there may need to be a "special option" or specfic courses on distance education, in which there would need to be a section specifically on the planning and management of audio-visual media.

Planners and Managers within Distance Learning Institutions

A specific course on distance education would be shared by general educational planners and by planners and managers within distance learning institutions. A section or option concerned with audio-visual media might concentrate on very similar areas to the ones outlined above, but in more depth. In addition, there would need to be more emphasis on what specific teaching functions different media should be used for in different kinds of institution.

A New Breed: Instructional Designers?

A more radical proposal put forward at the workshop was that there was a need to create a new sort of professional communicator in distance education able to help objectively and sensibly the content specialist to communicate his message through a variety of media (broadcast radio/ TV, non-broadcast A/V, print, posters, etc.) This person would be a multi-media producer (possibly commissioning specialists where necessary), programme. There is a Steering Group for an International Institute of Distance Education, consisting of the heads of 16 distance learning institutions, which has tried to raise money for an international organisation. So far it has managed, through members' subscriptions, to set up a documentation centre on distance learning, staffed by a resources officer, but the future of the Institute still looks very uncertain. Lastly, there have been several international conferences and workshops in distance education or aspects of distance education, such as the Conference on the Education of Adults at a Distance held in the Open University in 1979, and two conferences on the evaluation of educational media, one at the Open University in 1976 and one in India in 1980. IIEP also organised a workshop on the training and research needs for evaluation in educational media, in the U.S.A. in 1980. None of the workshop participants though was aware of any coherent course on the planning and management of media in distance learning institutions currently available.

What is clearly required is some provision which will enable the various relevant people to come together on a more systematic basis to exchange knowledge and experience, and perhaps create "modules" or sections for a course, and case studies. This would probably need to be done through an international agency, such as IIEP, working in conjunction perhaps with the Steering Committee for an International Institute for Distance Education and relevant aid agencies. What would be particularly useful would be the creation of modular materials which could be used locally or regionally in workshops or self-study situations, supported by one or two consultants. The Open University already has some training materials of this kind, mainly for internal training purposes, based on Open University experience. These could form a model for the creation of training materials more suitable for other distance learning institutes.

However it is organised, it is clear that there is a need to break down the isolation of planners and managers in distance learning institutions. By their nature, there are only one or two such institutions in any one country. An exchange of ideas and personnel in a realistic working situation, and a coming together to discuss common problems (as was demonstrated by this particular exercise), is urgently needed, despite the unique features of each institution.

Research

It is not so easy to identify research needs, except in two areas. One is the collection and analysis of various models for costing the internal activities of distance learning institutions (see section 8)

The other concerns inter-institutional collaboration. Because of the high cost of creating distance learning materials, particularly in the audio-visual media area, much could be gained by finding ways to improve inter-institutional collaboration in the sharing of information and learning materials, and possibly co-production. Research is required to analyse needs in these areas and to help develop and improve information systems.

11. CONCLUSIONS

It may be an exaggeration to say there is a crisis of confidence in the value of audio-visual media in the twelve organisations, but there are signs that television and radio in particular are proving to be of less significance in the teaching systems or more difficult to use successfully than was originally expected. Athabasca reported:

> "In the early days media seemed modern, sexy and a 'good thing' for an innovative institution.........unless help comes soon our use of (television) will either die out or become strictly 'public service' in style."

Frankly, radio at the Open University plays a very minor role in the teaching system (see Bates, 1979, for a discussion of the reasons for this), and given the costs, the value of television has been variable, to say the least. In most of the institutions in the study, despite their being chosen specifically because of their use of audio-visual media, print has proved to be the main medium of instruction. Where the use of audio-visual media seems to be increasing is in non-broadcast audio-visual media.

The down-grading of the role of broadcast media could be due to one of two reasons. It could be that the inherent nature of broadcasting makes it difficult to use effectively in distance learning systems. No matter what one tries, broadcasting cannot be made to work adequately in distance learning systems - or so many other things have to be changed or done that it is not worth the hassle. An alternative explanation is that broadcasting can be valuable, but still not enough is really known about how to use or organise it to the fullest effect.

It is perhaps too early yet to write off broadcasting. To be fair, it has not really been tried to any great extent in most distance learning institutions. There is still the major need to find a variety of ways of reaching students, and thus broadcasting potentially remains a valuable resource, but it does need to be properly harnessed. There are enough examples of the successful use of broadcasting to encourage a search for better ways of using it in distance learning systems. How can this be done?

1. The crucial issue still seems to be how to enable academics and subject specialists who have been largely educated themselves through print and face-to-face tuition to understant the necessity and the potential of audio-visual media. This seems to be a major task for planners and managers.

2. Another challenge for managers and planners within the distance learning institutions is the rapid development of new technologies and their impact on broadcasting. Training in how to cope with this major development is essential.

3. Lastly, it is clear that general educational planners are still often ignorant of the special needs of distance learning organisations, and particularly their needs with regard to audio-visual media. This does seem to be an essential training need.

If the IIEP initiative can help planners and managers in just these three areas, it will have made a major contribution to the development of distance education.

The Planning and Management of Audio-Visual Media
in
Distance Learning Institutions

APPENDICES

1 Distance learning institutions using (or planning to use) audio-visual media

2 List of Paris workshop participants

3 Data on use of television, radio and audio-cassettes in twelve selected distance-learning institutions

4 Appropriate teaching functions for television, radio and audio-cassettes in the Open University system

5 Advantages and disadvantages of various strategies for improving transmission and distribution of audio-visual media

6 Bibliography on audio-visual media in distance learning institutions

Appendix 1

DISTANCE LEARNING INSTITUTIONS USING (OR PLANNING TO USE) AUDIO-VISUAL MEDIA

Model No. (Bates)	Definition (after Kaye and Rumble, (1980)	Distance Learning Systems (examples only)	
1.	Media-based formal school systems	Primary and secondary levels	American Samoa
		Secondary level	El Salvador
		Primary level	Ivory coast
		Primary and middle levels	Korea (south)
		Secondary	Maranhão, Brazil
		Secondary (Telesecundaria)	Mexico
		Primary (maths only)	Nicaragua
		Primary	Niger
2.	Conventional teaching institutions which, as well as enrolling internal, campus-based students, offer and run their own distance-learning courses for external, off-campus students.	Télé-CNAM	France
		University of South Australia	Australia
		University of Zambia	Zambia
		Memorial Univ. St. Johns	Canada
		University of Wisconsin	U.S.A.
		University of South Pacific	Oceania
		University of Lagos	Nigeria
3.	Independent organisations providing distance tuition, either for qualifications or accreditation awarded externally by publicly recognised examination boards or universities, or on formal school curricula, for those outside the formal school system.	Distance Learning Centre	Lesotho
		College of the Air	Mauritius
		Extension College	Botswana
		Correspondence Courses Unit, Univ. of Nairobi	Kenya
		National Extension College,	United Kingdom
		CEMPAE	Mexico
4.	A massive, centralised state provision for distance education at all levels	Centre National de Télé-Enseignement	France
5.	Autonomous institutions established solely and specifically for external students, and having formal responsibility for evaluation and accreditation	Allama Iqbal Open Univ.	Pakistan
		Athabasca Univ.	Canada
		Everyman's Univ.	Israel
		Fernuniversität	West Germany
		Open University	United Kingdom
		S.L. Institute of Distance Education (SLIDE)	Sri Lanka
		Universidad Estatal a Distancia (UNED)	Costa Rica
		Universidad Nacional Abierta (UNA)	Venezuela
		Universidad Nacional de Education a Distancia (UNED)	Spain
		Télé-université, Quebec	Canada
		North Island College, British Columbia	Canada
		National Television and Radio University for Teachers (NURT)	Poland
		Projected Palestine Open Univ.	Palestine
		Sukhothaithammathirat	Thailand
		University of the Air	Japan
6.	Different organisations collaborating to provide between them integrated, multi-media courses for students over a wide area	German Institute of Distance Education (DIFF)	West Germany
		Norwegian Institute of Distance Education (NFU)	Norway
		University of Mid-America (UMA)	U.S.A.
		"START"	Sweden
		Entente de l'Est	France
		National Univ. Consortium, Maryland	U.S.A.

Model No.	Definition	Distance Learning Systems (examples only)	
7.	Non-formal, integrated, autonomous multi-media school systems aimed at adults, school leavers, or school drop-outs, but not providing nationally recognised formal educational qualifications.	Accion Cultural Popular (ACPO)	Colombia
		Adult Literary Campaign	United Kingdom
		Agricultural Information Section	Nepal
		Distance Teaching System	Philippines
		Mtu Ni Afya (health)	Tanzania
		National Literacy Campaign	Tanzania
		Institute of Adult Education	Tanzania
		Uchaguzi wako (national election)	Tanzania
		Wakati wa Furuha	Tanzania
		Radio farm forums	Ghana
		Radio farm forums	India
		Telescuola	Italy

No. of institutions or projects included in literature survey (i.e. those above): 55.

No. of countries with institutions or projects included in this study: 40

Other distance learning organisations not considered for inclusion in the workshop (but some of which *were* included in the literature search)

1. Educational broadcasting services of national or state broadcasting organisations, or of Ministries of Education, unless serving part of a broader, integrated, multi-media teaching system.
2. Community and educational cable television channels, companies or stations.
3. Satellite instructional television experiment (S.I.T.E.)., India (a "once-off" experiment, buil
around a test of the technology).
4. Ontario Educational Communications Authority (OECA), Canada, (primarily an educational broadcas
organisation).
5. Children's Television Workshop (CTW), U.S.A. (primarily an educational broadcasting organisati
6. Agency for Instructional Television (AIT), U.S.A. (primarily an educational television organisation).
7. Chicago College of the Air (primarily an educational television organisation).

Appendix 2

LIST OF PARTICIPANTS IN IIEP PARIS WORKSHOP

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DATA ON USE OF TV, RADIO AND AUDIO-CASSETTES IN TWELVE SELECTED DISTANCE LEARNING INSTITUTIONS

Information refers to 1980 ( ) denotes planned numbers

General	Allama Iqbal Univ.	Athabasca Univ.	ETV Maranhão	Everyman's Univ.	I.A.E., Tanzania	Lesotho DLC	Mauritius CA	N.F.U. Norway	N.U.R.T. Poland	Open Univ., U.K.	SLIDE, Sri Lanka	U.N.E.D., Costa Rica
No. of students	31000 (?)	3500 (12000?)	21500 ?	10000 (15000)	38000 ?	10,000 (30,000)	15,000 ?	? ?	70000 ?	85000 (100000)	5000 ?	7000 (15000)
No. of courses	20 (136)	50 (200)	?	100 (250)	21 ?	12 (100)	?	?	8 ?	127 (150)	?	36 (78)
Life of courses (in years)	5	4	4	5	4	6	?	?	?	8	?	4
Starting date	1975	1975	1969	1976	1972	1976	1973	1981	1974	1971	1977	1978
Educational level	1,2,3,6,7	1	5	1,2,3,4,6	2,3,4,6	2,4,6,7	3,4,6,7	(3,6,7)	2	1,2,3,6	3	1,2,3,6
Length of study (h.p.w.)	8 - 10	6-10	8	15	3	14	?	(varies)	3	12	?	18
Local centres: no:	75 (200)	5 (10-15)	45	30	20	7 (12)	(4 or 5)	(varies)	10	260	15	18 (24)
Importance (1 ± nec. 4 = not nec.)	2	3	1	2	2	3	↑	↑	3	3	2	3
frequency of attendance	weekly	monthly	daily	monthly	monthly	fortnightly	?	will	monthly	monthly	weekly	monthly
max. time to reach centre (mins.)	30	120	30	60-90	?	3 hrs.	|	vary	180	60	?	60
media available at centre (see code)	R;TV	VC;CAI:TT	TV;TB	VC;AC;F	CT;R	CT;A;AC	↓	↓	VC;AC;CT	TV;R;CAI;AC	AC	VC;AC
Media used (most or all courses):												
Main medium	CT	CT	TV	CT	CT	CT	TV	(CT/TB)	TV	CT	CT	CT
Correspondence texts (CT)	✓	✓	-	✓	✓	✓	-	✓	-	✓	✓	✓
Text Books (TB)	-	✓	✓	-	✓	-	✓	✓	✓	✓	-	✓
TV (broadcast or cable)	✓	-	✓	-	-	-	✓	✓	✓	✓	-	✓
Video Cassettes (VC)	-	-	-	-	-	-	-	✓	-	-	-	-
Radio (R)	✓	(?)	-	-	-	✓	✓	✓	✓	✓	(✓)	(✓)
Audio-Cassettes (AC)	✓	-	-	-	-	✓	-	✓	-	( )	✓	-
Other (see code)	F-F	TT	F-F	F-F,TT	-	-	F-F	(F-F)	F-F	F-F	F-F	F-F;TT

1 = University
2 = Teacher Educ.
3 = Other vocational
4 = Secondary
5 = Primary
6 = Cont. Ed. for adults
7 = Basic Ed. studies

R = Radio
TV = Television
VC = Video-cassettes
CAI = Computer-aided instruction

TT = Telephone tutoring
FF = Face-to-face tutoring
TB = Text books
AC = audio-cassettes

CT = Correspondence Texts

	Allama Iqbal Univ.	Athabasca Univ.	ETV Maranhão	Mauritius CA	Everyman's Univ.	I.A.E. Tanzania	Lesotho LDC	NFU Norway	N.U.R.T. Poland	Open Univ., U.K.	SLIDE, Sri Lanka	U.N.E.D. Costa Rica
Radio												
No. of radio programmes produced p.a.	350 (750)	15 (100)	NO RADIO	?	90 (100)	34 (90)	480 (600)	?	80	200 (150)	NO RADIO	? (156)
No. of radio programmes distributed p.a.	1976	50 (200)		?	250 (450)	34 (90)	500 (600)	?	80	1400 (1000?)		90 (980)
Method of radio distribution								-				
Broadcast direct to homes ONLY	✓	-		-	-	✓	-	-	-	-		-
Audio-cassettes to centres ONLY	-	-		-	-	-	-	-	-	-		-
TX to homes + ACs at centres	(✓)	-		-	✓	-	✓	(✓)	-	-		(✓)
TX to homes + Ac's mailed to homes	-	✓		-	-	-	-	(✓)	-	✓		-
Hours per week radio transmission	5 (15)	?		1	5 (2)	?	4 (6-7)	(1)	2	26 (?)		? (10)
% of target audience reached by radio	100%	90%		99%	99%	45%	40%	90%	99%	99%		90%
Source of production												
Separate broadcasting organisation	-	-		✓	✓	-	-	✓	✓	✓		-
Own production unit	✓	✓		-	-	✓	-	-	-	-		✓
Average radio production load per producer	45	?		?	?	?	40	(30-40)	?	10		?
No. of courses using radio	All	Some	None	Some	Some	Some	Most	Most	Most	Most		Some

Television	Allama Iqbal Univ.	Athabasca Univ.	ETV Maranhão	Mauritius CA	Everyman's Univ.	I.A.E. Tanzania	Lesotho DLC	N.F.U. Norway	N.U.R.T. Poland	Open Univ., U.K.	SLIDE, Sri Lanka	U.N.E.D. Costa Rica
No. of TV programmes produced p.a.	94 (350)	0 (10)	510	?	30 (50)	NO TELEVISION	NO TELEVISION	?	130	220 (300)	NO TELEVISION	60 (120)
No. of TV programmes distributed p.a.	?	150	?	?	120 (200)			?	130	1500 (1780)		?
Method of TV distribution												
Broadcast direct to homes ONLY	✓	✓	-	-	-			-	-	✓		-
Video-cassettes to centres ONLY	-	-	-	-	-			-	-	-		-
TX to homes + VCs at centres	-	✓	-	-	✓			(✓)	✓	-		✓
Broadcast direct to centres ONLY	-	-	✓	✓	-			-	-	-		-
Hrs. per week TV transmission	1½ (4½)	12 (10)	?	3	3 (2)			(1)	3	35 (25?)		4 (12)
% of target audience reached by TV	35%	50%	50%	99%	95%			90%	99%	99%		90%
Source of production												
Separate broadcasting organisations	✓	✓	-	✓	✓			✓	✓	✓		✓
Own production unit	(?)	-	✓	-	✓(VC)			-	-	-		(✓)
Average TV production load per producer per annum.	50	N/A	58	?	-			(9)	?	6		?
No. of courses using TV	Most	Some	All	All	Some	None		(Most)	Most	All		Most

Audio-Cassettes	Allama Iqbal Univ.	Athabasca Univ.	Everyman's Univ.	ETV Maranhão	Lesotho DLC	Mauritius CA	N.F.U. Norway	N.U.R.T. Poland	Open Univ. U.K.	SLIDE, Sri Lanka	I.A.E. Tanzania	U.N.E.D. Costa Rica
No. of audio-cassettes produced p.a.	↑ NO AUDIO CASSETTES ↓	30 (100)	20 (20)	↑ NO AUDIO CASSETTES ↓	50 (100)	↑ NO AUDIO CASSETTES ↓	?	↑ NO AUDIO CASSETTES ↓	120 (300)	Few (?)	↑ NO AUDIO CASSETTES ↓	6 (60)
No. of audio-cassettes distributed p.a.		50	100		200 (500)		?		200	(?)		8
Method of audio-cassette distribution												
Mailed direct to homes		✓	✓		-		?		✓	-		-
Delivered/mailed to centres		-	✓		✓		?		-	✓		✓
Source of production												
Separate broadcasting organisations		-	-		-		?		✓	-		-
Own production unit		✓	✓		✓		?		✓	✓		✓
No. of courses using audio-cassettes	None	Some	Some	None	Some		(None)	None	Some	Some	None	Some
% of target audience with AC machines	10?	100%	75%	?	?	?	80%	25%	80%	30%	?	33%

Appendix 4

APPROPRIATE TEACHING FUNCTIONS FOR TELEVISION, RADIO AND AUDIO-CASSETTES IN OPEN UNIVERSITY COURSES

- A summary of functions proposed in successful course team bids -

Broadcasts can be considered as having two distinct aspects: the actual content of the programme in terms of the topics or concepts contained in the programme; and the way in which this content is used, by either the teacher or the students. The latter might be called the intended teaching function. Experience in the use of broadcasting at the Open University suggests that television and radio are particularly appropriate for certain teaching functions. Some of these are listed below.

GENERAL

There are several functions particularly appropriate to both television and radio which nevertheless are so general that they would apply to all programmes in the OU context.

1 to increase students' sense of belonging; identification of and with course designers; making the teaching less impersonal;

2 to reduce the time required by students to master content from reading alone;

3 to pace students; to keep them working regularly; to break inertia of beginning to study in evening;

4 to recruit or attract new students (either to the University or to specific courses); to interest general viewers in subject matter;

5 to establish academic credibility of course to 'outside' world.

In a situation though of scarce resources, course teams are expected to propose more specific teaching functions for television and radio. Some of these functions are associated with courses in some faculties more than others and those are indicated in the margin.

TELEVISION

1 To demonstrate experiments or experimental situations, particularly

(a) where equipment or phenomena to be observed are large, expensive, inaccessible or difficult to observe without special equipment;

Science/Technology/Psychology

(b) where the experimental design is complex;

(c) where the measurement of experimental behaviour is not easily reduced to a single scale or dimension (eg human behaviour);

(d) where the experimental behaviour may be influenced by uncontrollable but observable variables.

2 To illustrate principles involving dynamic change or movement.

Maths/Science/Technology

3 To illustrate abstract principles through the use of specially constructed physical models.

4 To illustrate principles involving two-, three-, or n-dimensional space.

5 To use animated, slow-motion, or speeded-up film or video-tape to demonstrate changes over time (including computer animation)

6 To teach certain advanced scientific or technological concepts (such as theories of relativity, or quantum theory) without students having to master highly advanced mathematical techniques, by using instead animation, physical models, televisual representation of two, three or n-dimensional space, and of dynamic change or movement.

7 To substitute for a field visit (eg to a factory, museum, archeological or architectural site, geographical location, etc). Field visits may be used for a number of purposes, for example:

Science/
Technology/
Social
Sciences/
Educational
Studies/
Humanities/

(a) to provide students with an accurate, comprehensive visual picture of the site, or to provide an overall visual context or environment for certain phenomena, in order to place their study in context.

(b) to demonstrate the relationship between different elements of the particular system being viewed (eg machinery, production processes, ecological balance).

(c) to observe differences in scale and process between laboratory and mass-production techniques.

(d) to assist students to differentiate between different classes or categories or phenomena in situ.

8 To bring to students primary resource material, or case-study material, ie film or recordings of naturally occuring events, which, through editing and selection, demonstrate or illustrate principles covered in the units. This material may be used in a number of different ways, for example:

Social
Sciences/

(a) to enable students to recognise naturally occuring categories, symptoms, phenomena, etc (eg teaching strategies, mental disorders, examples of certain kinds of human interaction etc);

Technology/

(b) to enable students to analyse a situation, using principles or criteria established elsewhere in a unit; or to test students in this way.

Educational
Studies/

(c) to enable the course team to demonstrate ways in which more abstract principles or concepts established elsewhere in a unit have been applied to the solution of "real-world" problems, where visualisation of the application in its total environment is necessary to understand the way the principle has been applied, and the difficulties encountered.

9 To demonstrate decision-making processes

(a) by filming or observing the decision-making process as it occurs;

(b) by dramatisation;

(c) by simulation or role-playing.

10 To change student attitudes

Social
Sciences/
Technology/
Educational
Studies (contd)

(a) by presenting material in a novel manner, or from an unfamiliar viewpoint;

(b) by presenting material in a dramatised form, enabling students to identify with the emotions and viewpoints of the main participants;

(c) by allowing the students to identify closely with someone in the programme who overcomes problems or himself changes his attitudes as a result of evidence presented in the programme or televised exercise.

11 To bring students examples of films or television programmes, where the critical study and analysis of film or television itself is the subject material of a course.

All
Areas

12 To record specially events, experiments, species, places, people, buildings, etc, which are crucial to the content of units, but may be likely to disappear, die or be destroyed in the near future.

13 To explain or demonstrate practical activities that students are to carry out themselves (eg home experiments, interviewing, project work).

14 To condense or synthesise into a coherent whole a wide range of information which would require considerable length in print, and which in print would not provide the richness of background material necessary for students to appreciate fully the situation.

15 Through performance, to demonstrate methods of techniques of dramatic production, or different interpretations of plays and novels.

Humanities/

16 To teach sketching, drawing or painting techniques (eg the sketching of 3 dimensional engineering components, the construction of frescos, the drawing of perspective, etc).

Technology

17 To demonstrate the way in which instruments or tools can be played or used; to demonstrate the skills of craftsmen and their relationship with the materials and tools which they use.

18 To analyse, through a combination of graphics and sound, the structure of music.

RADIO AND AUDIO CASSETTES

The respective advantages and disadvantages of radio cassettes are discussed fully in OU/77/9 (IET papers on broadcasting No. 79).

In general, radio has a clear cost advantage over cassettes for courses with more than 750 students per annum; otherwise cassettes have clear educational advantages over radio, with one or two exceptions described below. Audio material intended for distribution on cassette only will usually require a different production style and format than audio material designed for radio transmission, although teaching functions may be similar.

More Appropriate for Cassettes (cost factors being equal)

1 To analyse or process detailed visual material. This visual material may take the form of mathematical equations or formulae, reproduction of paintings, graphs, statistical tables, "real" objects such as rock samples, technical drawings, architectural drawings, maps, etc. (The purpose of the cassette is to "talk" students through the visual material).

2 To enable students through repetition to obtain mastery in learning certain skills or techniques, (eg analysis of language, language pronunciation, analysis of musical structure and technique, mathematical computation.)

3 To analyse or critically review complex arguments, or carefully structured logical arguments.

Appropriate for Cassette or Radio (cassettes are still likely to have educational advantages over radio, but radio would not be inappropriate for the factors listed below)

1 To bring to students primary resource material, ie recordings which, which, through careful editing and selection, can demonstrate principles covered in the units. This material may be used in a number of ways, for example

(a) recordings of naturally occurring events, eg political speeches, children talking, concerts of performances, talks previously recorded for other than OU purposes (eg Reith lectures), eyewitness interviews of historical events;

(b) to provide students with a selection of sources of evidence to analyse.

2 To bring to students the views of knowlege of eminent people who can condense in an interview the essential points of an argument or opinion, or who can be edited afterwards, to provide the essential points, which otherwise in written form may have been more complex or lengthy.

3 To record specially the voices of people who have not been recorded before, but whose contribution to the course would provide a unique experience (eg famous poets reading their own work, civil servants talking - perhaps anonymously - about their role in decision making.)

4 To change student attitudes

(a) by presenting material in a novel manner, or from an unfamiliar viewpoint;

(b) by presenting material in dramatised form, enabling students to identify with the emotions and viewpoints of the main participants.

5 To provide the student with a condensed argument, in lecture form which may

(a) reinforce points made elsewhere in the course;

(b) introduce new concepts not covered elsewhere in the course;

(c) provide an alternative view to that presented in the correspondence text and/or television programmes;

(d) analyse material contained elsewhere in the course, especially in specially written broadcast notes or television programmes;

(e) summarise the main points of the block or course as far as it had gone, providing integration and orientation;

(f) draw on quotation, recorded information, interviews, etc, as evidence in support of (or against) the argument.

6 To enable students to perceive that different points of view exist, an observe ideas being challenged, through discussions and interviews.

7 To provide students with performances of music, drama, poetry, for appreciation.

More Appropriate for Radio (cost factors being equal)

1 To provide remedial tutorials, or some other form of tutorial based on feedback.

2 To provide corrections, where print re-make budgets are limited, or where print cannot reach students quickly enough.

3 To relate course material to current events, (eg news stories, recent natural hazards, social, environmental, political or industrial developments), emphasising the relevance or application of principles or concepts covered by the print material.

4 To up-date course material, to take account of events during the life of the course.

5 To provide external criticism or alternative viewpoints to course material in second or subsequent years of presentation, as a result of exposure of course material to public review.

6 Radio can be used where only one hearing of the material would generally be considered sufficient. This might cover a number of circumstances:

(a) an introduction, summary, or overview of a unit or block.

(b) a discussion, where the raising of issues and counterviews is considered to be more important than the actual arguments themselves.

(c) where an experience - such as a performance of music, a dramatisation, a poetry reading - is considered to be of more value than an intellectual analysis of concepts, or the provision of information.

(d) a single argument or story, again where analysis of the argument or story is less important than familiarising the student with the argument or story, or reinforcing ground covered elsewhere in the course.

Paper F follows as an example of a bid to the Subcommittee for broadcast resources.

Prepared for the Broadcast Subcommittee

by

A. W. Bates

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ADVANTAGES AND DISADVANTAGES OF VARIOUS STRATEGIES FOR IMPROVING THE TRANSMISSION AND DISTRIBUTION OF AUDIO-VISUAL MEDIA

There are several strategies available for dealing with transmission difficulties:

1. Avoiding or supplementing conventional broadcast transmission. This is an attempt to find alternatives to the normal transmission facilities of broadcasting organisations:

Audio-cassettes. Audio-cassettes can be used in two ways for distribution. They can be used to supplement broadcast transmission - in other words, a radio programme is transmitted but students can also listen to it on cassette, if they miss the programme or cannot receive the transmission. Alternatively, cassettes can be used to replace radio broadcasts - in other words, the programmes are available only on cassette. If programmes are available only on cassette, there are also important implications for production, which are discussed further in Section 7. There is also a decision to be made about whether cassettes should be mailed directly to students' homes, or be available only at local centres. It is not necessarily cheaper to broadcast rather than to use cassettes; nor is it necessarily cheaper to make cassettes available only at centres rather than mail direct to students. There are clear pedagogical advantages in using cassettes rather than broadcasts, which also have to be balanced against the costs. Lastly, even when students do not have their own cassette recorders, costs are low, and distribution of cassette machines to students, or requesting students to purchase cassette machines, may not be out of the question financially, compared with transmission costs. This is an area where it is possible, indeed, imperative, to base decisions on cost-benefit analyses (e.g. see Bates and Kern, 1977).

Video-cassettes or discs. Cost factors make video-cassettes or video discs a less attractive alternative for television, particularly if there are large quantities of programmes to be copied for large numbers of students. The cost of cassettes or disc replay machines, and their lack of availability in most students' homes, generally means that they can be used only in local centres. Without careful planning, video distribution schemes can escalate costs dramatically, and need careful study before being implemented. There is also a wide range of ways in which video distribution schemes can be organised, which can influence considerably their likely use and cost. The Open University has carried out a number of studies in this area (see for instance, Gallagher and Marshall, 1975; Martin, 1979; Bates, 1980; Dickinson, 1980). As, however, more and more institutions acquire video replay equipment, in schools and local colleges, so the opportunity for collaboration increases. A recent study in Norway (Bates, 1978) indicated that few communities were without a video replay machine in their area. At the same time, reliance on video replay at local centres would shift the emphasis for a number of institutions from home-based to centre-based learning. There is also the possibility it would be even more difficult to obtain suitable transmission times from broadcasting organisations if a local video replay service was also available.

Night-time transmission. This is really a variant of cassette distributi Recorders might be at regional resource centres, local study centres, or in the students' homes (if audio). Such a scheme has been suggested both in Norway (for video) and the United Kingdom (for audio). There are several possible disadvantages though of such a scheme. Equipment costs (i.e. timers and recorders) are likely to be high, unless loaded on the student, and physical distribution, by mail, might be more certain, or even cheaper. For home recordin there would be difficulties for students who wanted more than one programme transmitted on the same night, unless they happened to be broadcast in sequence. Again, careful cost-benefit analysis is required, with a particularly careful analysis of alternatives.

Satellite. The main advantage of a satellite would be the increased amount of channels available and the guarantee in most cases of full national coverage. The decision, however, on ground reception facilities will be crucial. Presumably, most distance learning systems would be more interested in direct transmissions to homes, rather than to ground relay stations, which would then retransmit the signal by conventional terrestrial broadcasting or cable. However, direct transmission to homes would require widespread ownership of the right reception equipment, and this will take a number of years to happen. Satellites though do offer a possible long or even mid-term solution for transmission (providing that governments get the planning right). However, satellites appear to offer little help in the short term (i.e. the next five years), although perhaps now is the time for distance learning institutions to be discussing what arrangements they would prefer, and influencing their governments. (The Open University has already submitted its comments to a government department studying the feasibility of direct satellite broadcasting in Britain). Similarly, discussions about cable distribution, or re-engineering existing transmission facilities to provide extra channels for educational purposes, might also be discussed.

Creation of a national educational broadcasting channel. Thailand has already decided to build a new radio broadcast distribution system to provide a channel solely for education and development broadcasting, and this will be used by Sukhothaithammathirat, Thailand's Open University, as well as by a number of other educational and development agencies. Suthothaithammathirat plans to occupy approximately 50 hours a week out of a total of 117, on this new channel. Costa Rica also has, or is planning to have, national cultural and educational broadcasting channels both for television and radio. There was a strong possibility that Britain would have had a similar television channel, but this proposal for an "Open" channel from a government commission died with a change of government.

However, even the provision of channels dedicated solely to educational and cultural use does not guarantee sufficient or adequate transmission times for distance learning systems. Sukhothaithammathirat is in strong competition with other, non-formal education organisations for the prime evening transmission tim Other development and cultural agencies can often claim larger numbers of listener or viewers than distance learning institutions, and particularly in developing countries, other agencies' priorities on an educational and development channel might be considered higher than those of a distance learning system.

The four alternatives to conventional broadcast distribution - cassettes, satellite, a dedicated educational network, night-time broadcasting - all requir substantial capital expenditure, or transfer costs to students, or require the co-operation of other agencies, or require strong government support. In many countries, such alternatives are not politically or economically feasible. Even when they are worth considering (and audio-cassette distribution seems the most practical), careful pre-planning and analysis before implementation is essential as the cost of a mistaken decision can be very high indeed. There are several planning techniques or previous studies that can provide guidance on this kind of planning. However, it is possible, as we shall see, that even if the money political support, and co-operation are available, there may be better solutions than trying to find alternative distribution systems.

ii. Removing repeat transmissions. There are two basic reasons for repeating the same programme each year. The first is to allow students to see or hear the programme twice. This could provide reinforcement, allow students to consider points missed on the first transmission, or see or hear something again that they did not understand the first time round. The second is to allow students who miss the first transmission to have a second chance of viewing or hearing the programme. By 1974, it was apparent in the Open University that if production was to continue at the same rate (around 300 programmes a year) and programmes were to have a life of six years or more, there would eventually be too many programmes to allow each one to be repeated in the time available

(30 hours a week). The problem was delayed a little by increasing the amount of transmission time to 35 hours a week, by introducing early morning broadcasting. However, there has been little overall reduction in the level of programme production until very recently, and consequently, in the last three years, there has been a steady decrease in the number of programmes with a repeat transmission. This year (1980) only 75% were repeated, and by 1982, the figure is expected to be as low as 47%.

Institutional research staff at the Open University have argued that the effectiveness of television in particular has been seriously reduced by the loss of repeats (Bates, 1975c; Gallagher, 1977; Grundin, 1980). (Radio has been less affected, because it has been possible to provide students with cassettes, and radio was not in any case ever used by students as much overall as television).

Viewing figures have dropped by up to 20% on those courses which have lost their repeat transmissions. With two transmissions at different times of the week, one of which is at a reasonable time, over 90% of students are able to see a programme. However, because of differences in students' work and social patterns, even the best single time is suitable for only 80% of students, because the other 20% cannot be at home at those times. As more and more programmes have come into the schedule, and as other pressures have forced the Open University to lose some of its most suitable times, programmes with even a single transmission are having to be transmitted at times when many students on a course are unable to watch. The BBC staff have argued that students will make the effort to watch, even if the programme is shown only once, if the programme is relevant and valuable, but the viewing figures in general do not support this argument.

While we have been able to measure accurately the effect on viewing figures of the loss of repeats, we do not know the additional effect of students not being able to watch a programme twice. However, some of our other studies show that many students do not fully comprehend the contents of Open University programmes, so the loss of a repeat showing is likely to be significant in this respect, as well. Perhaps the most serious effect though is likely to be on course teams.

Because they cannot be sure that students will be able to watch the programmes, they are becoming reluctant to include essential teaching material in the programmes. Except in Science, students are not examined on the contents of the television programmes, unless there is either an alternative question, or the material is also available in another form.

It therefore seems that the loss of repeats not only erodes the strategic principle of accessibility for working adults, but also erodes the tactical principle of using television for important teaching functions better suited to television than other media. Dropping repeats therefore does not appear to be a good solution to the problem of insufficient transmission time.

III. Increasing the quantity of transmission times at "off-peak" hours. Programmes broadcast at "off-peak" times, such as early morning, before students go to work, or early evening, when a large proportion of students have not returned home from work, or late at night, when other programmes have finished, can be useful, as a repeat facility. There will always be a minority of students who cannot in any case watch or listen at peak times, because of their work. Students who normally can watch or listen at a peak time, but unavoidably miss a programme, will normally be willing to watch or listen at an 'unsociable' time, so long as it is an occasional event.

However, even if students are willing to watch or listen early in the mornings or late at night, these are not good times for studying. Students may have to leave for work shortly after the early morning transmission, and therefore are unable to do the follow-up work, so that the programme becomes an isolated event. For late night transmissions, students may be too tired to take in the programmes, or to do the follow-up work. It may just be impossible for students to get away from work in time to catch an early evening programme.

One also has to watch the balance between peak and off-peak times. If there are more slots available at off-peak times, even with two transmissions a course may get both at off-peak times. Grundin (1979) found that two transmissions at poor times could have lower numbers of students watching than a single transmission at a good time.

Lastly, extending transmission time into unsociable hours could be a bad deal economically for the distance learning institution, if the institution is charged at the same rate as for "peak" times. For instance, consider a course with a 1000 students, of whom 80% (800) watch at "peak" time, and 20% (200) watch at an "off-peak" time. The unit cost per viewer is four times higher than for the off-peak time. Over a year, transmission at "off-peak" times can incur substantial costs for reaching a very few students.

iv. Sophisticated scheduling procedures. If there is a shortage of good transmission times, then it is inevitable that some programmes will be transmitted at better times than others. This is likely to be particularly true if broadcasts are transmitted over a period of time in the early evening, when people are returning home from work. A difference of 10 to 15 minutes can make a substantial difference to the numbers of people who can watch at such times. This means that a decision has to be made about which courses should get the best or worse times. Various criteria could be used. If television was used equally well on all courses, one could decide to give the best times to the courses with the largest numbers of students. However, research at the Open University shows wide variations between courses in students' assessment of the value of programmes. Science courses come out consistently high, while Educational Studies courses come out consistently low. Unfortunately though there are usually many more students on Educational Studies courses than on Science courses!

The University's Audio-Visual Media Research Group has developed a way of measuring both the quality of each transmission time or pair of transmission times (the viewing opportunity score), and the value placed by students on television and radio on each individual course (Grundin, 1979). Using this information, the University's Broadcast Sub-Committee uses the following criteria for allocating transmission times:

- foundation courses (which are always the largest courses) get one slot at a "good" quality time, and a repeat at another fairly good quality time
- new courses in their first year of presentation get times with good viewing opportunities
- each faculty is issued with a range of times for the remaining courses. The proportion of good times allocated to each faculty is determined by the performance of existing courses in that faculty in previous years, as measured by viewing and listening figures and student ratings. The faculty then decides which course to allocate to each transmission time given to it. If the faculty does not want to do this, then the administrative department responsible for scheduling does it for them.

In this way, courses which do well in terms of viewing figures and student ratings of television or radio in their first year are rewarded by continuing to be allocated better times; those that do badly in their first year are punished in subsequent years by receiving poorer times. It is hoped that in this way, a course that really does use television effectively has a reasonable chance of getting its programmes to most students on the course.

However, this system is only satisfactory while there are enough "good" tim around, and while a substantial proportion of programmes are considered to be unsatisfactory. There is a fear that as the Open University loses its best times, due to pressure from the BBC, it will not eventually have enough good times to give even new courses a fair chance. In any case, a distance learning institution ought to try to make all its pfogrammes valuable to students. Sophisticated scheduling procedures then do not solve the transmission problem, but merely limit its effect to certain courses.

v. Reducing the life of programmes. This is really not so much a positive decision, as the avoidance of a negative decision. It is a warning about extending course life. The number of programmes to be transmitted in any year can be simply estimated by multiplying the figure for the average number of programmes added to stock each year (either from original production or from purchasing) by the average life of a course (assuming that programmes will last the length of the course). Thus if a course lasts four years, and the average number of new programmes produced and/or purchased each year is 100, then it will be necessary to transmit 400 programmes a year. For a new institution, it will take 4 years to reach that figure, but provided a course is then replaced with a *new* course every four years, and no *additional* new courses are added, the transmission figure will remain steady at 400 programmes a year. However, it has taken the Open University over 10 years to reach a "steady state" - in other words, each year it has added new courses to the stock of those already existing. At the same time, it has extended the life of courses from an originally planned four years to eight years. With an average production load of 300 programmes a year, and an average life of eight years, the University will have 2400 programmes a year to transmit. If each of these had repeats, it would require 4800 slots a year, each of 25 minutes. Over a 32 week year, this would mean it would require 62½ hours a week transmission time - or nearly 9 hours a day, seven days a week! If courses had lasted only four years, as originally planned, this would have halved the amount of transmission time required (to 31 hours a week - almost in line with the 30 hours a week originally agreed in 1969). Thus, because of doubling the course life, repeats have had to be dropped, and production lowered. (An alternative would be to replace *programmes* but not courses every four years, enabling 300 programmes a year to be produced, but this obviously doubles the cost of broadcasting for each course - see also page 12 for a formula calculating the optimum balance between course life, production levels, and amount of transmission time required per week.)

vi. *Clearing the deadwood*. A solution put forward by BBC staff working with the Open University is to remove from the schedules altogether these programmes which are not found to be useful to students after the first year of presentation. If programmes are not found useful by students, it is argued, they should not take up time which could be used to give repeats to courses where programmes are found to be valuable.

Quite apart from the tricky problem of deciding which courses would lose their broadcast support, this solution would cause extra difficulties because of the need to amend or rewrite the accompanying printed material, if reference has been made to programmes. This would affect not only course materials, but catalogues and hand-books as well. Perhaps more critically, it would also be a wasteful use of resources. Part of the economic justification for using broadcasting is that the cost of programming can be averaged over the life of a course. If the programmes are thrown away after the first or second year of presentation, average unit costs would be much higher. However, if that would result in greater use of programmes on other courses, which would get repeats as a result, the strategy might be worthwhile. The Open University is considering experimenting with this strategy, to see if it is feasible. Again, however, it assumes that there will always be some courses which fail to use broadcasting properly.

vii. Making broadcasting optional. This is a very attractive solution at face value. It does not cost extra money, since there is no need to ensure that all students on a course can get the broadcasts. It asks for broadcasting to be treated in the same way as other extras in the system. It is, however, a dangerous attitude to take. There are several criticisms that can be made of this approach:

- those students who can get the programmes would be at an advantage compared with those who cannot get the programmes, if broadcasts were considered to play an important role. Since one of the main justifications for many distance learning systems is their potential for reducing inequalities, such an approach could be criticised on grounds of social justice. Those with television sets, or jobs with convenient hours, or those who are able to get home from work early, are likely to be already more advantaged socially and educationally

- if, on the other hand, it is decided that, because many students cannot get the broadcasts, they should not play a special or important role in a course, why use it at all, given its high costs?

- making broadcasts optional would encourage the avoidance of difficult decisions that ought to be made to improve the cost-effectiveness of the teaching system. If broadcasting is optional there is no need to decide exactly what the teaching role of television should be, or how much it is needed. If it is considered to be optional there is no need to find out whether or not it is being used at all. Since its main purpose is enrichment, any kind of programming can be justified, provided it is vaguely related to the topic of the course

- such a policy does not take account of the needs and psychology of distance learners. Because most are working and studying at the same time, time is a precious commodity. Students will not waste time on activities that are optional, or unnecessary for passing examinations or gaining credits.

VIII. Matching production and transmission. The relationship between production and transmission can be expressed mathematically. To take a simple example:

$$T = \frac{P \times L \times H \times R}{W}$$

where T = hours per week transmission time required
P = average number of programmes produced each year
L = average life of programmes in years
H = average length of each programme in hours or fraction of one hour
R = number of times each programme is transmitted in a single year (ie repeats)
W = number of weeks in an academic year

Thus, given values for each factor on the right of the equation, it is possible to calculate the weekly amount of transmission time required. Alternatively if transmission time is fixed, but production is variable, P can be calculated as follows:

$$P = \frac{W \times T}{L \times H \times R}$$

This needs to be modified to a certain extent, if programmes are remade each year, and if some programmes are transmitted outside the academic year. Thus, if F = remade programmes, and D = programmes to be transmitted in the period outside the normal academic year period (and as before L = average life of such programmes) then the production requirement is:

$$P = \frac{W \times T}{L \times H \times R} + F + \left(\frac{D}{L}\right)$$

The basic rule is that broadcasting organisations, if their full costs are being met, like to keep P high (to maximise production resources) and T low (so as not to interfere too much with general services). The only way to do this, however, is to put pressure on L, H or R to keep them low. However, given the high initial costs of course design in distance learning systems, it pays to run courses for as long as possible. Consequently, the distance learning insitiutions is usually reluctant to shorten L. The length of programmes (H) could be shortened by five minutes or so, but this will bring about only a fractional change, unless programme length is dramatically shortened (say to a half). However, the cost of production for a 15 minute programme compared to a 30 minute programme would not be very different, so u costs per programme would rise considerably. Furthermore, if programmes last for several years, there would be difficulties in using fully the transmissio time available, with varying lengths of programme. It is not surprising therefore that pressure at the Open University has fallen mainly on R - in other words, repeats.

There is another factor that has to be taken into consideration, and that is the *quality* of the transmission times. This can also be expressed quantitatively in terms of the percentage of students *able* to watch or listen at a particular time (the viewing opportunity). An *average* viewing opportunity ($\overline{Vo}$) can then be calculated for all the transmission times available. Alternatively, a *range* of *target* viewing or listening opportunities can be set for different kinds of courses. Thus, the target viewing opportunity for foundation courses, or science courses, where television may be considered essential, might be set at 90% of the audience, whereas for a music course, 75% might be an acceptable target figure, with a minimum target figure, say, of 50% for any course. If it was known for instance in advance of a new course that less than 50% would be *able* to watch at the times available, this might radically affect whether or not to use television, or, if it is decided to use it, what its role would be. It might also help decide whether or not to *accept* the offer of such times, for it is possible for a *smaller* total amount of transmission time to have a higher average than a larger amount, if the additional times are all at unsociable hours.

The essential point is that if production levels lead to a drop in the number of repeated programmes, or an increase in the use of transmission times at unsociable hours, the average viewing opportunity will drop (see Grundin, 1979). Consequently, four factors have to be balanced when negotiating with broadcasting organisations for production and for transmission times:

(a) the annual level of production (given a set course life) (P)

(b) the annual amount of transmission time (T)

(c) the quality of the transmission time ($\bar{V}o$)

(d) the effect of the balance between P, T, and $\bar{V}o$ on viewing and listening figures

The last point to be taken into consideration is the time factor. Repeats can be removed and changes made in the quantity or the quality of transmission time, comparatively quickly. However, it will take several years (i.e. the average life of a course) before changes in the level of production finally affect the amount of programmes to be transmitted. Thus while the Open University is now reducing quite substantially its level of television production, it will take five years (because of courses already made or in the pipeline) before this really affects the total amount of programmes to be transmitted.

Basically, because of the high costs involved, and because of the need to use to the full the unique teaching characteristics of television and radio, a primary aim of distance learning institutions with regard to broadcasting should be to ensure that viewing and listening levels are as high as possible. If students are unable or unwilling to watch or listen, it does not matter how professionally the programmes are made, nor how well they integrate with the other teaching materials, nor how important their role is educationally on the course. If students do not watch or listen to programmes, the investment of money, effort and time is totally wasted. Distance learning institutions are not totally dependent on decisions by broadcasting organisations regarding transmission times for maintaining high viewing or listening figures. Distance learning institutions can adjust level of production, course life, or a number of other factors to maintain high viewing or listening figures, if they wish.

Appendix 6.

BIBLIOGRAPHY ON THE USE OF AUDIO-VISUAL MEDIA IN DISTANCE LEARNING INSTITUTIONS

This bibliography is not meant to be fully comprehensive. It is limited to papers and publications in English to which I had access when preparing this paper. The bibliography concentrates on papers which refer to the use of media in those models of distance learning institutions represented at the workshop. I am very grateful to the Information and Resources Unit of the Steering Committee of the International Institute of Distance Education. Most of the references in this bibliography can be found in that unit, located at the Open University, United Kingdom.

The bibliography is organised around three categories:

(a) references to issues which could apply generally to the use of media in distance learning systems but not based on any specific case-studies

(b) references based on case-studies of several different distance-learning institutions

(c) references to an individual distance learning system in a specific country, organised under national headings. Model no. refers to my categorisation system.

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